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SETTLING DISPUTES BY ARBITRATION.

THE administration of the law in this country has been for a long time something to make the patriot grieve. When President Taft stated (a remark that he has repeated in one form or another a number of times)—that "the law's delay amounts in many cases to a denial of justice," he described the situation with true Presidential moderation. The eternal evasion of punishment by the rich criminal, and the interminable avoidance of settlement in civil suits by those who have the price of a new appeal, have long since become a national disgrace.

For some years there has been a feeling among honest business men that some new method ought to be devised—some direct and satisfactory method by which the disputes that must inevitably arise in the course of business—even among those who are in the main well intentioned—could be settled. The New York Chamber of Commerce has taken cognizance of this demand, and in January, 1911, established a method of commercial arbitration under its auspices, and appointed a committee under whose direction such ordinary business controversies or disputes could be settled without litigation.

This action of the Chamber of Commerce has so much significance for all those interested in any branch of our commercial life, that it seems well worth while to reproduce a brief description of the plan, which appeared in a recent issue of the "Independent"—which will be found on another page.

The advantage of submitting to arbitration commercial disputes which might otherwise lead to expensive litigation, was illustrated in a case which was recently settled through reference to this committee on arbitration, and which is of interest to both buyers and sellers of crude rubber.

The case above referred to was submitted in consequence of a dispute as to the quality of a portion of a shipment of Plantation rubber on a delivery made by a rubber importer to his customer, and the question at issue was whether the rubber was of "fair average quality," as described in the contract. As the contract had this provision, "Disputes, if any, to be settled by arbitration by the New York Chamber of Commerce," each of the disputants selected an arbitrator to act for him, and the third arbitrator (who was required to be a member of the Chamber of Commerce) was an officer of one of the well-known rubber manufacturing companies in New York. The result of the arbitration, by unanimous vote of the arbitrators, was the approval of the rejection of the lot of rubber in question by the purchaser.

It is of interest to business men to know that there now exists a method by which commercial disputes of any nature may be adjusted, and which is available to any merchant, whether he be a member of the Chamber of Commerce or not.

Disputes are bound to arise in the rubber trade, as they do in every branch of commercial activity, and the rubber men will certainly find it greatly to their advantage to avail themselves of this method of settlement, which is so direct, expeditious, inexpensive, and so free from suspicion. At the last meeting of the Executive Committee of the Rubber Club of America, held early in December, a resolution was passed "that the Executive Committee approve of the plan of commercial arbitration as adopted by the New York Chamber of Commerce." This resolution of approval of the act of another body was a most unusual step for the Rubber Club to take, but it certainly is fully justified by the great importance of this subject to the rubber trade.

THE RIO DE JANEIRO 1913 EXPOSITION.

RIO DE JANEIRO, a community of a million and a quarter inhabitants, the finest city on the South American continent—and by some travelers called the most beautiful city in the world—is to have a great International Exposition next May. It will be held under the authority of the General Government and will be under Federal auspices and control. It will be held in substantial buildings erected for permanent use in the handsome park that surrounded the palace of the Emperor Dom Pedro, the palace itself being converted into a museum. This Rio de Janeiro enterprise will be (in the words of the act creating it) "an Exposition of large plantation products and the industry of vegetable extraction, viz., sugar, rubber and fibres." While it is primarily a Brazilian exhibition, exhibitors from the outside world will be warmly welcomed and their exhibits will be entered duty-free—duty of course to be paid on them if they are sold in that country after the conclusion of the show.

This will be the best opportunity that the American manufacturer ever had to show his wares in the great Republic of the South.. The balance of trade between Brazil and the United States is all awry. According to the latest available statistics the value of the imports into the United States from Brazil amounts to $124,000,000 a year, which is over ⅓—or to be exact—36.2 per cent. of the total amount of Brazilian exports. But the proportion of Brazilian imports entering from the United States only amounts to 12.8 per cent., and as the total Brazilian imports are in the neighborhood of $200,000,000 that leaves the value of American goods sold to Brazilians at about $25,000,000 a year—or one-fifth of the amount of Brazilian goods sold to Americans. Obviously this is not as it should be, and the coming Exposition ought to offer a good chance to make a beginning, at least, toward evening up this marked inequality.

With the great industrial awakening now taking place in Brazil there should be an excellent market for mechanical rubber goods; and there is no reason why Brazilians should not use as many druggists' sundries, in proportion to population, as the people of the United States. The automobile, too, has made its way into all the Brazilian cities, and that should mean a constantly increasing number of American tires. The market for footwear is, of course, not so active in any of the tropical countries as in regions of plentiful snow, but even footwear in its lighter varieties ought to find a much larger sale in the great Empire of Brazil with its many thriving cities than is now the case. In any event, this would seem like a fine opportunity for the American manufacturer of rubber goods to show the South Americans what he has to offer.

DIGESTS OF THE RUBBER CONFERENCE PAPERS.

AT the Third International Rubber Conference held, in conjunction with the Rubber Exposition, in New York in September and October last, 18 papers were read on a great variety of topics—but all related to the rubber industry—by men of acknowledged authority in their particular field. We hope to publish these papers in full in future numbers of this journal, beginning with the February issue; but in a preliminary way, and as giving a sort of bird's-eye view of the whole subject matter of the Conference papers and discussions, we publish in this issue digests of these different papers.

These digests follow as closely as possible the thought of the author, but, of course, in the process of condensation—attempting to reproduce in 500 words a paper that in the original required 3,000—it is quite possible that full justice has not always been done the subject or the author. Whatever inadequacy, however, may be noted in these digests, will be atoned for, we trust, by the full publication of these papers in later issues.

PLANTATIONS IN BRAZIL.

AMONG the many interesting papers read at the Conference held in conjunction with the recent Rubber Exposition in New York—a digest of which appears in this issue—there was a particularly valuable paper on "The Present and Future of the Native *Hevea* Rubber Industry in Brazil," by Dr. Jacques Huber, director of the government museum at Pará. He described in detail the present situation of the rubber industry in Brazil. He spoke of the great awakening that has recently taken place in that country as to the necessity of immediate activity, if the Brazilian superiority in the crude rubber market is to be preserved; and he reviewed the obstacles that the Brazilians must overcome if they are to retain their supremacy.

It is obvious from Dr. Huber's paper that rubber plantations in South America to be successful must be oper-

ated in a large way. It will hardly be possible under the conditions prevailing there, for men with small capital, whose operations must necessarily be confined to narrow limits, to hope for much success. As the chief problem of the Brazilian planter is the labor supply, any plantation venture in that part of the world necessitates sufficient capital to include a broad scheme of colonization; which means that labor must not only be provided with conditions of life that are sanitary, but with conditions that are agreeable and attractive. In other words, it must be made possible for the laborer to keep his health and also to preserve his contentment of mind. This requires scientific sanitation, medical supervision, a sufficient supply of good and wholesome food, and the establishment of such an environment that the laborer will be satisfied to stay and become permanently identified with the undertaking. These requirements call not only for skilful management, but obviously for an abundance of capital.

But with the present attitude of Brazil, with its willingness and eagerness to encourage foreign capital to embark on the opening up of plantations, with the government extending such a warm hand of welcome, it would certainly seem as if American capital would be attracted to Amazon plantations. According to the American Consul at Pará, some American capital has already been invested in plantations near that city. It is likely to be followed by more. Certainly the field holds out many substantial promises, and the risk is no greater than usually attends the entrance of capital into a new field.

CHARLES GOODYEAR'S SON.

IN the department in this publication entitled "The Editor's Book Table," where current books are reviewed from month to month, there will be found in this issue a short description of a book on ancient Greek architecture, called "Greek Refinements," written by Professor William Henry Goodyear, Curator of Fine Arts in the Brooklyn Institute Museum. Many people in the rubber trade are familiar with Professor Goodyear—at least by reputation—and know that he has written a number of notable books on ancient architecture and other topics of a kindred nature; but probably very few rubber men are aware that he is the son of Charles Goodyear. Such, however, is the case. But as Charles Goodyear devoted his life to that experimentation in the utilization of a practically useless product that laid the foundation for the great modern rubber industry, his son has devoted his life largely to architecture, and rather to the history and literature of architecture than to its practical application. The father's life was an intensely practical one, while the son's career has been devoted (to borrow a word from the title of his latest book) to the refinements of life—to its intellectual rather than to its industrial activities.

At first glance it might seem that it is a far cry from the elder Goodyear eternally hovering over the kitchen stove with his pan-full of compounded rubber to the younger Goodyear minutely examining the curvatures of ancient Greek temples and mediaeval churches. But, as a matter of fact, the son comes logically enough by his peculiar mental bias. The elder Goodyear was a many-sided man. He was not only an indomitable—almost fanatical—experimenter, but he was a religious enthusiast, an idealist, and full of the artistic temperament; and this temperament inherited by the son has had full opportunity for expression. While the father devoted his energies to benefiting the millions of humanity yet to come, the son has devoted his energies to interpreting the thought of those who dwelt upon the earth centuries ago. It entirely satisfies one's sense of the proprieties to have a distinguished father followed by a distinguished son; it is not necessary, or desirable, that the one should follow directly in the footsteps of the other. As long as the son of a father who has achieved worthily fills his own life with worthy achievements, it is enough.

THE LATEST RUBBER STATISTICS.

THE statistics given by Mr. Arthur Lampard, quoted elsewhere, show an estimated rubber production for 1912 of 104,700 tons and a consumption of 108,250 tons; the reduction in the visible supply confirming those figures.

His remarks on future production and consumption are equally interesting. He does not anticipate that at current prices there will be any notable increase in the production of wild rubber in 1913, while he expects plantation rubber will go up from 28,500 tons to 40,000 tons. Judging from American expectations and from the large increase in American consumption which has taken place this year, he expresses the conviction that the whole of the increase in sight could easily be absorbed by America alone, even if all the other countries of the world are going to hold aloof, which, of course, he observes, is inconceivable. He adds that

the figures quoted prove that the statistical position of rubber has never been stronger than today.

Coming a little ahead of the usual annual statistics and based on actual results as far as the end of October (with careful estimates for November and December), Mr. Lampard's statistics are of marked interest as indicating the prospects of the rubber market, and in particular his recognition of the importance of the American outlet.

SIMPLIFYING RUBBER NOMENCLATURE.

ONE of the most important problems before the rubber trade today is the simplification and standardization of the nomenclature of crude rubber varieties. Twenty years ago this problem did not exist, as the crude rubber that arrived at our ports came practically all from one source, and while there was some variety, to be sure, there was not enough to be especially confusing.

But all that is now changed. With the exploitation of many forest trees—hitherto untouched—for an additional wild rubber supply, and with the great development of rubber plantations in all parts of the tropical world, the variety of crude rubber now coming to our ports is very large and constantly increasing, and necessarily occasions much confusion.

This matter was the subject of no little discussion at the Rubber Conference held in New York last September, and a committee was appointed of eleven members—three of them appointed by the Rubber Club of America, and eight of them by the Conference—to see what measures could be taken to simplify and systematize the crude rubber names now in vogue. This committee represented in its membership American importers, the plantations of the Middle East, and of the Pacific, and the wild rubber interests of the Amazon. A number of meetings were held and tentative lists of names for the more important varieties of crude rubber were submitted.

With the ending of the Exposition and the conclusion of the Conference, the members of the committee—many of whom were from foreign countries—became widely scattered, but the American members, together with the representatives of the Rubber Club, have been going over these lists with most painstaking care, and THE INDIA RUBBER WORLD hopes very soon to be able to publish the result of these deliberations.

There will be no suggestion of finality about these lists, but they will no doubt constitute an excellent beginning in the solution of one of the most pressing problems in the rubber industry today.

THE BLOOMING OF SHOES.

IF there is anything that fills the rubber footwear manufacturer with keen regret that he did not embark upon some other calling, it is a "blooming" shoe, or even more, a boot that "blooms," because the boot is worse, inasmuch as there is more of it. Any light on the wherefore of blooming is welcome to anyone whose duties include the successful vulcanization of rubber goods. A superintendent relates in another column of this issue some of his experiences with footwear that bloomed. It will be found interesting to those who have had like experiences.

He found that in the same lot of footwear made from the same rubber, with the same compounds, and subjected to the same degree and duration of heat, some shoes were entirely free from bloom, others bloomed a little, and still others a great deal. But when he examined his crude rubber he found that while it had been taken from the same lot, there was in reality a marked lack of uniformity in the different sheets, and in some instances in different parts of the same sheet; the rubber as a whole being hard, but having certain soft spots. He then made a trial mixture, vulcanizing three batches at the same time, all being similar except that one contained nothing but hard crude rubber, while the second contained a combination of hard and soft, and the third was made up entirely of soft rubber. The result was perfect vulcanization where the hard rubber was used, a noticeable bloom where some soft rubber was used, and a pronounced blooming where the rubber was taken entirely from soft spots, which shows the necessity of examining lots of crude rubber carefully, and—where there is any lack of uniformity—of separating the lots according to their quality, so that the different qualities may be subjected to different vulcanizing conditions.

FREQUENT MENTION HAS BEEN MADE IN THESE columns of late of the great industrial awakening that is taking place in Brazil. In connection with this situation it will be of interest to the readers of THE INDIA RUBBER WORLD to learn that the editor, Mr. Henry C. Pearson, is now on his way to that country, having sailed on December 16. He will make a brief stay in Barbados, and will proceed thence to the great South American Republic, where he will be able to observe at close range the New Brazil. The result of his observations will appear from month to month in these columns.

Hoolihan on the "Case of Caasey."

"CAASEY," said Hoolihan, "is tha wan av ahl uthers that gives me a paain!"

"What has he done?" I inquired.

"Listen, me bye, av iver a mon was thrained an' given ivery chance thot mon was Caasey."

"You mean the hose inspector of that name?"

"LISTEN ME BYE."

"Av thot naame, an' maany uthers as well. But it wuz as Caasey yez knew him. Phwat the assoshiated Boord av Overwriters' done fer him couldn't be missured be words. To staart at the beginnin' we sint him down to the nagur rubber gathurers in Brazzil."

"What?"

"Shure thing, we pit an insphector on the ground so thot Paraa rubber shud be Paraa rubber an' not be mixed wid cowchew or Ballatha or anny av thim infarior gooms. We had a laabel to pit an ivery caake, an' charged thim tin cints a laabel, glory be!"

"Glory be indeed!" I gasped.

"Not only thot, we laabeled the barls of soolpfur, av whitening, an' the kigs av litharge, an' we pit insphectors in ivery mill thot made thim vaarious stuffs," said Hoolihan with huge satisfaction.

"It must have cost your association a pretty penny."

"Divil a cint. The wans inspicted paay the cost, an' paay for laabels too. We give our consint to ahl av thim to do business an' they paay us fur it. We saay Nicholos Suarez the Rubber King av the *Madeira* makes rale Paraa rubber, see our label an his biscuits, yez kin buy av him av yu plaze (tin cints a biscuit, an' $500 insphectors' expinse, ahl fer us).

"But, but what does your inspector on a rubber estate do?"

"Do, is ut? He shows thim nagurs how to do. He watches thim pit the cups an the threes. Thin he seals up the cans av milk an' allows thim to be oapened only in his prisince. He annylizes the palm nuts to see av they have the requisut propoartions av sillicate av oxigin, bicarbonate av elasticum, an' Lithium av Wangaroo. He tists the hate av the smoak wid a thermomater. He taakes an observaation av the direction av the wind, an' the amount av preciptous moisture in the air. Thin the nagur does the rist. Thin, and oanly thin we affix our laabel."

"Wonderful; what does the label say?"

"Just this!" was the prideful answer.

> Fine Para Rubber
> Prepared under Supervision of
> Overwriters' Laboratories, Inc.
> No. 13,333.

"What does that Inc. mean?" was my query.

"Incloosive to be sure. Includes inspiction for paay, laabel for paay, an' unlimited taxation an' misriprisintation."

"It certainly seems very thorough," said I hesitatingly.

"Not half as thorough as we plan," was the enthusiastic reply; "we were oanly laabelling 20,000,000 articles in connixion av fire risks an' we naded more scoape."

"But—"

"Niver mind the but, it's about Caasey I am talking. He wint through ahl av the schools av inspiction, wild rubber in Brazil, ahl av the compounds in th' vaarious mills, an' thin he inspicted the makin' av laabeled fire hoase in th' rubber facthries."

"Yes?"

"And phwat do yez think he done?"

"Give it up."

"After larnin' ahl he cud av compounds an' processes he trew up his job an' staarted a facthery av his own an' is makin' fire hoase."

"HE SHOWS THIM NAGURS HOW TO DO."

"And now he will have to be inspected and labelled himself," I laughed.

Hoolihan shook his head sadly.

"Thot's the divil av it," he said; "he won't lave one of us

"WE HAD A LAABEL TO PIT AN IVERY CAKE."

over th' treshoald av his mill. He says he intinds to run his oan business widout bein' bossed be self-elicted intherferers."

"What shall you do?"

"PARAA RUBBER SHUD BE PARAA RUBBER."

"Oah we are ahl roight; there's plenty av others that hav' no thrace ov Caasey's foightin' timpermint. We will go afthir thim.

The Kingston Rubber Brush Co., of Kingston, New York, has increased its capital stock by $150,000 to $300.000.

STATISTICS OF RUBBER EXPORTS.

While statistics of American rubber goods exports of earlier periods are of interest for purposes of comparison, the most recent figures are the most valuable as a guide to future prospects.

American exports of belting, hose and packing for the twelve months ending June, represented for 1910, $1,960,825; for 1911, $2,163,416; and for 1912, $2,315,424. That this increase is more than being maintained is shown by the figures for August, which show in 1912, $269,239, as compared with $191,637 for the previous year.

Rubber boots and shoes for the three fiscal years ending June 30, represented: 1910, $1,984,739; 1911, $2,219,430; 1912, $1,502,890. The returns for August alone show: 1911, $247,953; 1912, $196,415.

Automobile tires, which in the fiscal year 1911 represented $2,085,107, increased in 1912 to $2,657,809. That a still further increase is in prospect is shown by the figures of August, 1911 and 1912, respectively, $251,262 and $405,781.

"All other" tires show a falling off, but for the fiscal year 1912, and for the month of August separately, the respective figures being $546,833 in 1912 against $592,470 in 1911. The August returns are for 1912, $46,937 against $58,615 in 1911.

"All other" manufactures of rubber, being a general head, its results are subject to various influences. The figures for the last three fiscal years are for 1910, $5,115,331; 1911, $3,886,825 and 1912, $4,144,273. August alone shows a slight retrogression from the figures of 1911, the amounts being respectively, $310,941 and $343,336.

Thus the more important articles of export, mechanical goods and automobile tires, are in a sound statistical position. That there should have been a falling off in rubber shoes is largely due to the extent to which they are now being made in other countries.

In export trade there is an unlimited field if rightly taken in hand, with a due appreciation of its difficulties and of how to overcome them.

A NOVEL MAT.

The Pennsylvania Rubber Co., Jeannette, is making a mat of unique design for dealers and jobbers selling Vacuum Cup tires. The surface of the mat is composed of a multitude of

cup-shaped knobs, similar to those on the tire-tread, and in the center is the V. C. trade mark. This mat is made of high quality white rubber and is in great demand among the company's agents.

A NON-SKID IN MOVING PICTURES.

THE advertising department of The Diamond Rubber Co. has hit upon a very clever device for showing the superiority of the "Diamond Safety Tread" tire over the ordinary smooth tire. This is done by a set of moving-pictures which show a smooth pavement recently wet by the sprinkling wagon; an automobile equipped with smooth tread tires comes down the street and turns a corner at a considerable rate of speed. The result is that the car skids around like a healthy young couple on a well-waxed dancing floor. Then comes another car equipped with the "Diamond Safety" and turns the same corner at the same rate of speed—but without any skidding, which is a fine way to tell a long story in two or three seconds of time.

Digests of the Papers Read at the Rubber Conference Held in New York.

SEPTEMBER 23 TO OCTOBER 3, 1912.

DIGESTS of the 18 papers read at the recent Rubber Conference held in New York, in September and October, in connection with the Rubber Show, are given below and on succeeding pages. The work has been carefully done, but a digest is never quite adequate or satisfying. The papers will be published in full in subsequent issues of THE INDIA RUBBER WORLD, beginning with February.

THE PRESENT AND FUTURE OF THE NATIVE HEVEA RUBBER INDUSTRY. (*Abstract.*)

By Jacques Huber, Museu Goeldi, Pará.

THERE is an opinion common among people interested in plantation companies that Brazilian rubber will be entirely supplanted by the product of the Eastern plantations within the next ten years. But it is a case where the wish is father to the thought. There seems to be no necessity for the disappearance or the reduction of the Brazilian crop. On the contrary, there will be increased need for the Amazon crop of rubber—and especially for the hard-cure Pará. The advent of plantation rubber has helped the industry as a whole, assuring the manufacturer that there will be no shortage in the supply, and tending to the general lowering of prices.

Brazilian producing centers appreciate the competition of the plantation and are preparing themselves to improve their position by lowering the cost of production. On the other hand, the plantations doubtless appreciate that Brazilian rubber will be able to hold its position because of its superior qualities, particularly the superior qualities of the hard-cure smoked Pará, whose resistance to exterior influence—light and temperature—is so much greater than that of plantation rubber. As an illustration, the stock held by the Pará Syndicate, after being kept two years in more or less overheated stores has improved in quality, and it is probably true that where crude rubber has these resisting qualities the vulcanized product will also have them.

One argument often adduced in the attempt to prove that the native *Hevea* rubber will disappear, is the difficulty of gathering rubber from the scattered forest trees; but this condition has its advantages also. These forest trees, though scattered, are much older and larger than the plantation trees, so that the worker can collect and coagulate as much as 10 kilograms (22 pounds) of rubber in a day, where the plantation tapper gets only 2 kilograms. Moreover, the fact that the native trees are widely scattered protects them from the spread of fungus and other diseases. Another reason cited to prove the disappearance of *Hevea* rubber, is the exhaustion of native rubber districts. This is true in some districts in reference to *Castilloa*, but not true of *Hevea*. The shortage of labor has not made it possible to exhaust the *Hevea* trees.

A third proof cited that *Hevea* will disappear is the scarcity of labor. It is true that labor in Brazilian forests is six times as expensive as coolie labor on the Eastern plantations, and that is the principal problem that South Americans have to solve. It is cited as a proof of the impending ruin of the Amazon rubber industry that the output has been practically stationary for the last few years. This is owing chiefly to the deficient organization of the entire industry and a lack of the proper amount of capital for its development. Unfortunately, the profits of the industry have not in sufficient measure gone back into the improvement of the general conditions, but during the last few years the Government and leading citizens have awakened to the necessity of instituting reforms and introducing improvements on a very large scale. Some of these reforms briefly are as follows: First, an improvement in the means of communication, making the rivers more navigable and building railroads on the banks of rivers made unnavigable by rapids; second, better food supply—cheaper in price and more accessible. With this in view the Federal Government has planned cattle breeding on an extensive plan in the upper *Rio Branco* region. And third, sanitation and other measures protective of the laborers' health.

In addition there must be special protection for young *Hevea* trees and interplanting among the old trees of the forest. There are seldom more than 10 trees per hectare (about 2½ acres). This number could very easily be doubled. Tapping methods may also be improved, although it may not be possible to adopt those of the Eastern plantation. First, because the trees are already defaced by the native methods, and second, because it would be difficult to train the natives to adopt a new system. The method of preparing the rubber may likewise also be improved, although no change should be made until its superiority over the present effective smoking process should be fully proved.

Is it possible to operate a plantation successfully on the Amazon? is a question constantly asked. There are a few old plantations in the State of Pará, but these as a rule have not been very successful. There are some private plantations but their records are not accessible. The new plantations started under the State protective laws are still too young to serve as a criterion. After the enactment of State laws offering many advantages and encouragements to rubber growers there was a rush to obtain these subsidies, and the registration in the Agricultural Department in two years' time has reached the number of 8,000,000 *Hevea* trees to be planted within the next four years. Of these, about 350,000 had been planted at the end of 1911. Rubber plantations planned and operated on a large scale, by companies with sufficient capital, hold out considerable promise in the Amazon region, though plantations here cannot be operated exactly as in the Middle East, because the conditions—and particularly labor conditions are so different. In a general way, rubber planting on the Amazon must either be carried on by the actual occupants of the land or by companies abundantly financed, which can operate an efficient scheme of colonization together with the planting; and what is most needed to insure success is efficient management. This has been lacking to a considerable extent in earlier plantation experiments as it has been difficult to secure men who have had just the right experience. The evolution of the plantation on the Amazon will doubtless differ from the plantation development in the Middle East. It will probably be of slower growth, but the plantation on the Amazon will undoubtedly come as a necessary complement of the forest rubber extraction, and the whole industry will be placed on a more scientific, more economical and more stable foundation.

THE PLANTATION RUBBER INDUSTRY. (*Abstract.*)

By Cyril S. Baxendale.

IT is a remarkable fact that the profitable cultivation of rubber should have been so long open to doubt. It was in 1876—36 years ago—that H. A. Wickham smuggled 70,000 *Hevea* seeds out of Brazil to London. 2,800 plants were raised at Kew

Gardens, and in the same year shipped to Perideniya Gardens, Ceylon. In 1877 a case of 22 plants reached Singapore and were planted in the newly founded botanic gardens there. In the same year the first *Hevea* trees arrived in the Malay States. It may seem strange that these trees reached maturity many years before it was realized that they were capable of yielding a sufficient quantity to make regular tapping profitable. The explanation lies in the very poor methods of tapping pursued by the Malayan aboriginals. In 1888 H. N. Ridley was appointed director of the Singapore Botanic Gardens and immediately began experimental tapping. In 1891 the first sample of plantation Pará was sent to London and favorably reported upon. The first actual sale of Malayan rubber was in 1899, realizing 3*s.* 10*d.* a pound; the rubber was taken from trees 22 years old. The first rubber planting on a commercial scale began in 1895. The slow development of rubber plantations at the beginning was attributable to lack of interest on the part of capitalists. Finally European financiers became interested and by 1905—38,000 acres in Malaya had been planted to *Hevea,* and from that time on the average increase has been 70,000 acres per annum—the total acreage at the end of 1911 being 542,877.

Then came the boom of 1909 with much indiscriminate speculation, comparable only in English history with the South Sea Bubble of Queen Anne's time. But the legitimate rubber men kept their heads and while the bubble was much deflated it did not burst.

The great advantage of the Malay Peninsula for rubber-growing is its regular rainfall. The Peninsula does not exceed 170 miles in width and it is the meeting place of the Northeast monsoon of the China Sea and the Southwest monsoon of the Indian Ocean—both contributing liberally and regularly to the precipitation. But while there is an abundance of rainfall there are very few days in the year when it is too wet to work, and this, of course, gives the planters in the East a great advantage in a matter of collecting rubber over wild rubber gatherers on the Amazon, where for several months of the year tapping has to be altogether suspended.

Another advantage of the Peninsula lies in its superior healthfulness. This is attributable to the scientific investigations by famous medical experts looking to the discovery and removal of the causes of disease. The richness of the soil is an additional attraction, and to this might be added that the success of the industry is due—not a little—to the confidence inspired by an absolutely honest and conscientious public service. The Planters' Association of Malaya comprises 600 plantations with an invested capital of £50,000,000, and an actual value of several times that figure.

In the early days of rubber cultivation the prevailing method was that of interplanting *Hevea* trees through the old fields of coffee. Then new jungle tracts were cleared and rubber and cocoanuts were planted in alternate lines, but this necessitated the destruction of the cocoanut trees in a few years' time to give the rubber trees sufficient room. At the outset the *Hevea* seeds were obtained from original stock and were quite expensive. Now they are obtained from trees of all ages and the expense is much less. In the hilly districts ordinary surface drainage is required, but near the coast land must be selected that can be effectively drained and this often involves considerable expense. In clearing an area for rubber the drains are laid out, the jungle is cut down, and branches lopped to a level of about 4 feet. A few weeks later the area is burned; afterwards the unburned branches and small trees are piled up and a second fire started. This leaves some stumps and big trunks, but in three or four years' time these have rotted and can easily be removed. Planting is done from seed or from stumps taken from the nursery from 6 months to 2 years old. There has been much controversy as to whether it is desirable to let the grass grow or to cultivate some cover stock, but in the author's experience, clean weeding followed by digging and plowing is preferable to any cover crop.

The cost of production is an ever-interesting phase of rubber planting, and planters are twitted over the difference between recent actual costs and early estimated costs; but there are reasons for this. The boom of 1909 materially increased the cost of rubber production, as the ad valorem export duties naturally were higher; while managers and assistant managers and even the coolies all demanded a part of the great prosperity that had come upon the planter. Moreover, many of the trees tapped were young. which made the collection expensive. With the return to normal conditions and the maturing of the trees, rubber production has declined in cost, and will still further decline.

The question of close or wide planting has been much discussed. One rubber botanist maintains that the trees should be 40 feet apart, which would be only 27 trees to the acre. The author's experience is against any such wide planting. Insect and fungus diseases are easily kept under control. On the author's plantations the loss does not average 2 per cent. from these causes.

In regard to the labor problem, which is likely perhaps to present more difficulties in the future than it has in the past, there is one obvious phase, namely that the Indian laborers are more anxious for healthful conditions than for extremely large pay, and that they will avoid plantations reputed to be unhealthful, nothwithstanding tempting wage rates. But the Chinese and Japanese laborers on the contrary, are willing to risk ill-health for better pay.

Some consideration has recently been given to the question of fertilizers in Ceylon, though little has been done in this direction in Malaya except where the soil is particularly rich in humus, where lime has been supplied to correct the acidity. The author believes that for some years to come, at least, systematic cultivation of the soil will prove more valuable than any sort of fertilizer.

Another question that is always uppermost is that of future supplies of rubber. The author has seen fields that produced from 800 to 900 pounds of rubber. per acre, but this yield is abnormally high. In his opinion a first-class plantation may be expected to yield an average of 500 to 600 pounds per acre. His estimate of the total acreage now under cultivation (including the 500,000 acres in Malaya) is 1,000,000 acres. His estimate of the production of plantations for the year ending 1912 is from 25,000 to 30,000 tons. The annual increase will be fairly steady, and in about 1918 the annual production of plantation rubber should be 100,000 tons—or equal to the entire consumption of the world at present. The present outlook is that consumption will fully keep pace with production, so that there is no imminent struggle between plantation and wild rubber.

The future of the planter depends entirely upon the activity of the manufacturer, and it is reasonable to expect that there will be a constant demand for rubber in lines of manufacture already open, and that in addition many new uses will come into vogue. A well-managed, favorably-situated and mature plantation can at the present time, produce rubber with a handsome profit at 60 cents a pound. Planters can guarantee an enormously increased supply of rubber and will in future years be content with a much lower price than now prevails. What interests the planters is to know whether with a larger increase in their output there will come a glut in the market in a scramble to sell, or whether the manufacturers will be able to take care of this constantly increasing supply.

THE COMMERCIAL POSSIBILITIES OF SYNTHETIC RUBBER. (*Abstract.*)

By Lothar E. Weber.

THE possibility of converting isoprene into a rubber-like substance has been known for twenty years, but little progress has been made in developing this knowledge until quite recently, owing to the vast proportions of this problem. The synthesis of rubber, however, received a new im-

petus about three years ago when two German chemists, Hofmann and Harries, working independently, simultaneously discovered products that gave the chemical reaction of rubber and possessed certain physical resemblances to the natural product. The recent forming of stock companies to place synthetic rubber on the market has attracted much attention to the subject on the part of the press and the public generally. While the author greatly admires the fine work of the chemists in accomplishing the results attained, he deplores the attempt to make the public think that synthetic rubber is an immediate commercial probability.

He cites the comparison synthetic enthusiasts make between the success in synthetic indigo and the probable success in synthetic rubber. In his opinion, the two problems have little in common, as indigo is an article of absolutely definite characteristics and properties, and moreover, the investigator can tell in a few moments whether the product he has obtained is indigo or not, a condition totally differing from the conditions under which synthetic rubber is made. Synthetic rubber is obtained by the polymerization of isoprene. This the author defines as a process whereby a large number of small units combine to make a single large unit. It is essentially a process of agglomeration. The molecules of isoprene—at least a hundred of them—unite and polymerize into one single molecule of rubber, but the difficulty is that it is impossible to determine how many isoprene molecules are necessary to make one molecule of rubber, and equally impossible to obtain any uniformity of polymerization. The chemist cannot control the process. He says: "With the chemical methods available to-day, it would be absolutely impossible to make a product with an assured uniform degree of polymerization," and without this uniformity commercial synthetic rubber is an impossibility.

Synthetic enthusiasts also ignore a very important fact, that by 1916 the plantations will be producing at least 100,000 tons of rubber, and that in consequence the price of rubber will be much lower than at present. Plantation rubber is even now—according to report—being produced at 25 cents per pound. At any rate, the large dividends of many plantations show that much plantation rubber is now being produced at a comparatively low figure, so that even if synthetic rubber could now be marketed in large quantities at 50 cents a pound, it would soon come in competition with plantation rubber that could be produced even cheaper. Moreover, it will be quite possible for the plant physiologist to still further increase the production of rubber plantations just as he has increased the beet-sugar yield.

Synthetic indigo was able easily to overcome competition with the natural article, because natural indigo was produced under the crudest and most unintelligent methods. In rubber plantations the case is entirely different as the rubber planters are keenly alive to all the possibilities of scientific methods of cultivation, production and preparation. Briefly, the author's position is this: That with our present chemical methods it is impossible to assure a uniform synthetic product, and that within the next few years plantation rubber will be in a position to make a stubborn fight against any synthetic rubber product. He does not take the ground that synthetic rubber will never be a commercial possibility, but doubts whether anyone now in the rubber industry will live to see synthetic rubber in successful competition with the natural product.

THE TAPPING OF RUBBER TREES. (*Abstract.*)

By R. Fyffe.

THE operation called tapping is one of extreme importance and the present methods are susceptible of marked improvement. This subject did not receive the consideration in the London Conference of 1911 that its importance warrants.

After the close of that exposition the author toured through Ceylon, the Federated Malay States and Java, studying the preparation of rubber and methods of tapping. Subsequently, he made many tapping experiments and reached the conclusion that the best method was a combination of excision and incision.

Excision alone he believes detrimental to the tree, as the coolies in their endeavor to get the maximum latex almost inevitably cut too deep, thus injuring the lactiferous tubes close to the cambium. These deep wounds heal slowly, retard the growth of the tree and give access to fungus. He does not consider incision alone practical, but advocates a shallow excision combined with incision made by a fine push pricker. Where the points of the pricker are fine they may penetrate the cambium without injury. He does not advocate broad blunt teeth. He got satisfactory results from a push pricker with gramophone needles filed flat on two sides and fitted ⅛ inch apart into a small block of wood. He followed the half herring-bone system on about one-third of the tree's circumference.

NOTES ON THE ACCLIMATIZATION AND CULTIVATION OF THE GUAYULE (PARTHENIUM ARGENTATUM—GRAY). (*Abstract.*)

By Francis E. Lloyd,

MacDonald Professor of Botany, McGill University, Montreal.

IN connection with the general conditions affecting guayule cultivation, the results available to the author have been from plants grown at Cedros, Zacatecas, Mexico; Tucson, Arizona; Stockton and Austin, Texas; and Auburn, Alabama. These situations included the semi-arid Chihuahuan and Sonoran deserts, within the former of which the guayule has its natural habitat; the moister climates of Eastern Alabama (with a rainfall of 45 to 55 inches), and Eastern Texas.

Guayule is by no means uniform in structure within its natural area; the variations arising being due to differences in available moisture, this being in turn attributable to greater rainfall or to the character of the soil. These structural differences are those of relative thickness of the bark (or *cortex*), which is thinner in proportion to the greater amount of water available. Correlated differences are to be noted in the length of the annual accretions of stem.

In the easternmost region of the distribution area (the state of Nuevo Leon) the practical extraction of crude rubber is reduced, roughly speaking, to about 4 to 5 per cent. of the wild weight. This does not necessarily mean that the amount of rubber, in proportion to the volume of rubber-bearing tissues, is less than elsewhere, but that the volume of woody tissues is greater. Nevertheless such may be the case, and in view of what we know about the relation of water supply to the amount of rubber secreted, it is not considered improbable that the actual intracellular secretion in these Nuevo Leon plants is somewhat less than in dryer regions.

The well-known habitual differences between "Macho" and "Embra" guayule have been attributed to racial differences, but whether this is so or not, the practical distinction in Mexico is marked, the former being regarded as decidedly better in rubber content. The inferiority of the latter is due to the greater relative volume of the woody cylinder and the relatively greater number of smaller branches.

One of the principal differences in minor details is that the greater the water supply, up to the limit thus far observed, the greater is the volume and hardness of fibrous or woody tissues barren in rubber, the greater the irregularity of growth, and the larger the number of smaller twigs and leaves.

As to the tenure of life, a combination of conditions may prove fatal to plants when moved to another habitat, while they might successfully resist the influence of any one factor. Thus guayule can withstand cold better under arid, than moist, condi-

tions. The tenure of life in a new habitat depends, moreover, upon the ability of a plant to resist new enemies. Thus in Alabama, thrips and nematodes have been seen to affect guayule badly. In the semi-arid desert, on the contrary, no case of death has been noted during three years, save as the result of insufficient irrigation. It is deduced from this behavior that the resistance of an irrigated plant to drought is much less effective than that of one grown under usual conditions.

With respect to rate of growth it is estimated that the average dry weight of a plant would be 1 pound, and assuming 10,000 plants to the acre, a 2 per cent. rubber content would yield 200 pounds of rubber in two growth seasons, followed by six months of suppressed irrigation. At 60 cents per pound this gives a return of $120 per acre for two years, or $60 per acre per year, subject to the charging of the usual costs. Were the yield of rubber even 6 to 7 per cent., it would not compete with onions in irrigated land. It is assumed that it would not pay to grow the plants longer than two years.

The rate of growth in the moister climate of Auburn, Alabama, is less rapid than in the desert under irrigation. In the first season a height of 8 to 10 inches is attained, but the additional growth in the second is meagre. Thus only the rubber secretion of the first season has to be considered. This, it is added, is practically nil, the possibility of growing guayule in this region being excluded.

After dealing with the method and character of rubber secretion, the author draws the conclusion as inevitable that the determining factor in the cultivation of guayule is control of the water supply. In the presence of an abundance of water applied irregularly and at too frequent intervals, it will take more than three years for the maximum cell amount of rubber to be attained. A quantum approaching the maximum is attained, on the other hand, if plants which have been well irrigated for two seasons are then subjected to drought conditions for six to eight months.

LABORATORY ORGANIZATION IN THE RUBBER INDUSTRY. (*Abstract.*)

By Frederic Dannerth.

IN view of the necessity of arriving at positive data, successful corporations have arrangements with the managing director to purchase at the lowest possible market price the best raw materials for a given purpose; to criticize the manner in which the factory manager is making up these raw materials and help him to attain perfection; to help the salesmen when competitors are offering better quality for same or less money; and to deliver to the factory manager, heat, light and power at the lowest possible cost.

In factory management, as now carried out, all chemical problems are first presented to the supervising chemist of the works, who occupies a position parallel to that of the factory manager and the operating engineer; being wholly or partially employed by the particular corporation.

The duties of this department are: (1) To investigate all new processes; (2) to constantly improve existing ones; (3) to correct and explain irregularities of current operations; (4) to invent new and useful processes; (5) to determine the value and exact composition of all raw materials; (6) to determine the value and composition of competitors' products; (7) to advise correctly on "specification goods"; (8) to control different stages of many processes.

Co-operation with the laboratory by every department is thus necessary for the full use of the constructive forces at work.

The supervising chemist, whose value is in proportion to his far-seeing capacity, has five first assistants: the engineering, buyer's, factory, sales and research chemists. In the laboratory organization are included the abstracting of foreign and domestic technical literature and of patents; as well as a library of catalogs. Superintendents should present monthly to the supervising chemist reports of their own or their assistants' ideas, warranting investigation.

The engineering chemist's most important field of activity is the examination of materials used by the power plant; co-operating with the buyer's chemist, who is essentially an analyst; and whose duty it is to devise rational specifications on standard material. The factory chemist investigates problems arising in the factory, and looks after the writing of recipes to meet certain specifications. The sales chemist makes analyses of commercial rubber products offered by competing firms, and conducts the final tests on specification goods. The research chemist's duties include dealing with the periodical and patent literature of all countries, as well as the investigation of the latest advances in machinery for chemical processes, and the utilization of wastes. He should embody the varied talent and knowledge required in a wide field, and should have a properly equipped research laboratory with miniature rubber machinery. Together with the supervising chemist and the factory manager he forms the research committee, which meets regularly to consider all important investigations.

The supervising chemist has the supervision of the work of his five first assistants, and calls a weekly meeting of the chief chemists to discuss standard analytical methods and patents of interest to the rubber industry. A digest of this meeting should be forwarded to all the chemists of the company for comment and filing; while the supervising chairman has in his office a card index with condensed abstracts of relevant articles from chemical journals. The efficiency of the chemical department may be increased by periodic visits of the supervising chemist to the different laboratories of the company and to those of other industries, in order to incorporate in his organization the favorable developments made by them. Laboratory buildings should be roomy, well lighted and ventilated, likewise equipped with all the apparatus required for accurate and rapid work.

The central laboratory and office should have a file of chemical and engineering periodicals and standard works. All the laboratories should be in the same building, to facilitate library references and consultations by the individual chemists.

Another point of importance is the holding of periodical general meetings of the chemists to promote cordial co-operation and to discuss specific subjects; as well as the periodical exchange of chemists between the different laboratories, to broaden the experience of the individual chemist. Monthly reports should be made by each laboratory to the supervising chemist, explaining all difficulties encounted in the course of investigations and making suggestions for improvements in existing methods.

When a corporation has plants in different cities, the central laboratory should be connected with one of the large plants, so that mechanics may be available for construction work in the laboratory. Such an arrangement, moreover, allows of chemists asking advice of foremen and superintendents.

The rules to be posted in the laboratories should provide: For the verification of the accuracy of weighing and measuring apparatus; for standard solutions being checked by the head or one of the chief chemists; for all important investigations to be in duplicate and all clerical work and calculations to be checked; for the employment, even in the simplest determinations, of systems of weighing and manipulation, devised to prevent errors.

The form of organization of which the leading features have been described, must never take the semblance of dull routine; while the interest in the work can be decidedly promoted by having the chemist come into personal touch with the department for which he is doing work.

Scientific management resolves itself into buying the best material of a given grade at the lowest possible price and selling the finished product of a given quality at the lowest possible price. To accomplish this our manufacturers have drawn to their aid the services of men exercising the above functions.

FACTORY MANAGEMENT METHODS. (*Abstract.*)

By J. C. Jurgensen.

THE interest manifested lately in "scientific management" for factories has produced a large number of efficiency engineers, whose efforts are looked on with some skepticism by many manufacturers. Where they have failed, however, it has usually been owing to their method rather than to the principles involved. It is extremely difficult to lay down hard and fast rules for the efficient management of a factory. Even when the plant is thoroughly analyzed and investigated, the system must be fitted to each case. Whether the factory manager can himself apply it, depends upon his talent for investigation and administration. The human factor is the most serious problem he is called on to solve. Each employe, whatever his position, should have his duties thoroughly defined, and must be chosen with careful reference to them.

All orders for work emanating from the manager's office should be carefully planned and explicitly worded. Clearness should be insured by a system of checking before the final issue of the order. The indefinite order is the father of every bad habit in foremen and workmen, and leads to disorganization of plant and factory.

It is an important function of factory management to encourage general industrial education and vocational training, many experienced men being found willing to act as teachers of the young men in the service of the company.

Organization is a matter of fundamental importance, and the successful factory manager has some simple method or system for determining the responsibilities and authorities of all his subordinates. On his solution of these daily problems depends the success or failure of his management. The factory manager must know what he wants to accomplish and, having decided on the method to be used, must stick to it. Changes of plan and spasmodic efforts never lead to results. Repeated changes in methods create misunderstandings, insubordination and intrigues, while organization, although it cannot entirely prevent such conditions, will greatly minimize them.

The organization in which each department head is selected to perform the duties for which he is best fitted, has the elements of a perfectly co-ordinated factory, but to insure practical co-operation between the various heads, a supreme authority must be provided, in the form of the owner, a firm management committee, or the factory manager. The absence of such an authority leads to indecision and general disorder; divided authority always causing shirking of responsibility. A thoroughly competent assistant is recognized as the acting work manager when his superior is absent.

After an expert organizer has had an opportunity to analyze the nature of the business and to classify the work, a series of organization charts should be drawn up by him, showing graphically the departmental relationship, as well as the extent of departmental responsibility.

The cost system is another essential in factory management; showing plainly the well operated and improving departments and those badly run. It creates a more determined and careful management, but does not stop at executive organization; gauging the value and efficiency of every operative, every machine, and every operation. With proper use it can become not only historical, but prophetic. When this can be done the cost system is established. Its proper employment by an energetic factory manager enables him to analyze any part of the plant; at the same time setting standards of mill expenses and unit costs.

While the sales price of the product cannot be controlled by the factory, the cost of production can; the latter being the one vital element in the industrial world to-day. Even if incomplete, a cost system will be of use to the management. As every penny spent in the mill is part of the cost of the product, it is the function of the cost system to determine daily where each individual expenditure shall be charged.

A practicable system is best established by finding departmental totals for material, labor and mill expenses; then going after details. To begin with details and go up to totals is wrong. When the totals have been proven with the accountant's books, the factory manager can divide them as required; each cost item being checked with the total. Thus the modern factory manager, in his fight for better managment and methods, must install a practical expense control system.

PROBLEMS IN VACUUM DRYING. (*Abstract.*)

By J. P. Devine.

THE author's connection with the rubber industry dates from ten years back, when he sought to interest manufacturers in this country in a new method of drying rubber. He found that they were satisfied with the then existing method, and did not hesitate to express their opinion that any shortening of the drying process would sacrifice the quality of the rubber and jeopardize standards established during the course of years.

At the outset of his investigations, the author found that little, if any, advancement or improvement had been made up to that time. His opinion was thus confirmed of the value of the Passburg Vacuum Drying Process (originated and designed by Emil Passburg and William Strohn of Berlin), for economically and thoroughly removing moisture, particularly for the removal of the final traces, as is necessary with rubber and rubber compounding materials.

This new process was introduced in Germany by Messrs. Passburg and Strohn and in this country by the author, and has proved of great benefit to the rubber industry.

For years rubber was dried by any convenient method, not involving capital expenditure, such as a boiler room. Subsequent improvements included the adoption of drying lofts, where the sheeted rubber was hung on racks, the heat being distributed by coils, or hot air circulated by fans or blowers. Little regard was paid to the temperature or duration of the drying process. The fallacy of the claims sometimes made in favor of these old systems is proved by the use of the vacuum apparatus, and by the superior quality of the rubber dried by that system.

The improvements introduced from time to time only served to reduce the effects of high temperatures, with a consequent prolongation of the drying period. Heat and oxygen, however, are the two insidious enemies of rubber, always present in hot air drying. They are eliminated by the vacuum apparatus.

Another objection to the hot air system of drying is the contraction of the rubber and the hardening of the surface, which prevents the elimination of the last moisture within the rubber, except by a prolongation of the drying period. The vacuum process and apparatus alone afford the proper conditions for the rapid, uniform and thorough drying of rubber at a low temperature and without oxidation, independently of climatic conditions.

While under atmospheric conditions, rapid boiling can only take place at 100° C. or 212° F., and the drying time is extended as the temperature decreases—under vacuum, the boiling point is greatly decreased as the barometric reading is approached. Thus at a vacuum of 29", water boils at 25° C. or 77° F. Rubber dried in the vacuum chamber, while the first free water is being removed, need not be heated practically above the boiling point of water at that particular vacuum. The supply of the heating medium—steam or hot water—is regulated and is entirely shut off before the final drying. The last traces of moisture are therefore drawn off by the latent heat in the dryer, accelerated by the high vacuum. In a properly constructed vacuum chamber, with the condenser and pump properly balanced, the application of well known physical laws absolutely prevents any over-heating if reasonable care be taken in its operation.

By reason of the absence of oxygen, oxidation cannot take place. The rubber not being overheated, nor impaired by oxida-

tion, has greater elasticity and tensile strength, enabling the manufacturer to obtain the greatest yield when being made into the final product.

As different grades of rubber must be subjected to varying temperatures, the temperature of the heating medium is easily regulated without overheating or materially affecting the time of drying, so that the vacuum process offers many advantages over the old method of drying rubber, whether it be fine Pará or Pontianak.

Owing to the drying period only taking a few hours, varying according to grade of rubber, the crude rubber can be washed, dried and pressed in a fraction of a day. Consequently, there is no deterioration between drying and using.

With an average establishment of today, with a consumption of two tons, if the old hot air method is used and six weeks consumed in drying the washed and sheeted rubber, there would be 72 tons of rubber hanging in the drying lofts, representing an idle investment of $144,000 on raw material, besides insurance, factory space, etc. The same quantity of rubber could be more thoroughly and permanently dried by one or two vacuum chambers in a day of ten hours, thus working up the requirements of each day's output, with an initial cost of installationn less than that of the old-fashioned drying rooms for the same quantity. Besides paying for itself the vacuum chamber gives an otherwise unattainable flexibility to the factory for its daily production. A vacuum drying chamber having a capacity of two tons of dry sheeted rubber every ten hours, occupies a space 8½ ft. high, 15 ft. wide x 9 ft. long, its auxiliaries, the condenser and pump, being conveniently located in any place in the factory near the dryer.

While not more than one-third of the heat units are utilized by any hot air system—by the vacuum process practically every heat unit is transmitted to and comes in direct contact with the material being dried. The apparatus itself is practically indestructible and only requires one operator. There is a considerable saving of fuel and the time of drying is shortened from weeks to hours, combined with higher efficiency. The condenser connected with the vacuum chamber (as well as the vacuum pump) should be of the proper capacity for condensing the vapors given out during drying; while the necessary heating surface must be balanced in order to transmit a certain temperature, and if the condenser is burdened with a much larger quantity of vapor than it is calculated to cool, the result is detrimental, both to the product and the working of the pump.

Basing his view on the foregoing and other facts quoted, the author submits the opinion that it is wrong to subject apparatus to work for which it is not intended, and attribute the unsatisfactory results to the principles of drying under vacuum, viz.: rapidly and thoroughly at a low temperature.

While the use of the vacuum drying process was first adopted by manufacturers to dry washed rubber, much thought has of recent years been given to the preparation of crude rubber on the plantation. This fact is especially noticeable in the quality of the rubber reaching the market from the Malaysian, Straits Settlements and Congo Plantations, where this process has been installed and found of great value. This is somewhat reflected in the moisture content of plantation rubber, which reaches the market with a low percentage of moisture, as compared with 15 per cent. or more in Upriver Pará. Planters will understand in the future that the price is based on actual rubber, and that they will serve their purpose by adopting the very latest method for the treatment of the raw material, so as to free it from inpurities and let it contain a minimum percentage of moisture.

This improvement in quality of the raw material will not cause the discontinuance of the process of drying at the factory, but will restrict its use to the removal of the final percentage of moisture only, thus simplifying factory operation.

The results of scientific and research work in the laboratory have materially contributed to the advancement of the industry, and its further progress can and will be accomplished by a closer and more intimate relationship between the manufacturer or producer and the appliance manufacturer. The author asks in conclusion why users and makers of machinery should not recognize their mutual obligations to co-operate, so that a maximum productiveness by newer and better methods may be secured.

LITHOPONE AND OXIDE OF ZINC IN THE RUBBER INDUSTRY. (*Abstract.*)

By G. C. Stone and Gilbert Rigg.

THE zinc oxide of commerce is a white amorphous powder, the purity of which depends on the character of the ore from which it is produced. With the exception of those from Franklin Furnace, New Jersey, zinc ores contain considerable lead and usually cadmium. Their presence, when the object is to make a white product, is inadmissible, while their absence insures regularity in the composition of oxide of good color. For example, the oxide made by the New Jersey Zinc Co. contains upwards of 99 per cent. zinc oxide.

Zinc oxide is made by two processes, the direct or American, and the indirect or French. The first drives off the zinc from the ore by the action of carbon at a high temperature, the zinc vapor being burned direct to oxide. In the second, metallic zinc or spelter is first produced by smelting, this metal being then burned to oxide. The latter is the more costly and the products of the two differ in certain material points.

Purity is the first essential of a zinc oxide for rubber purposes, while uniformity of composition is likewise very desirable for arriving at a good result. The authors believe that users of oxide should confine their analytical work to testing for adulteration and suitability for a particular purpose by a practical laboratory compounding test, rather than spend much time and effort in attempting to determine the zinc contents of the oxide.

Commercial zinc oxide consists of extremely minute particles, forming more or less coherent aggregates resembling a slightly elastic sponge entangling considerable air.

It is necessary to distinguish clearly between the coherence of an oxide and the true specific gravity, these two properties being sometimes confounded under the term "density." The determination of the actual specific gravity requires considerable care, as the oxide tends to retain its entangled air, a good vacuum pump being used to insure that the air has been completely expelled.

While screening is often useful for breaking up aggregates, this method is, according to the view of the authors, useless for sizing oxide of zinc, owing to its extreme fineness. This can best be done in a bolting machine. Revolving screens without heaters tend to form balls, while shaking screens have a like tendency.

Oxide of zinc, the use of which is rapidly increasing, is one of the most important ingredients of manufactured rubber. It is remarkably constant in chemical composition and physical properties, and is also rarely adulterated.

LITHOPONE.

Lithopone is an amorphous white pigment obtained by mixing solutions of barium sulphide and zinc sulphate, which causes a transfer of the acids and produces an intimate mixture of zinc sulphide and barium sulphate. In properly made lithopone every particle of the barium sulphate appears coated with zinc sulphide; the opacity being much higher than that of a mixture of the dry salts in the same proportion. It is largely used in the manufacture of rubber goods, but in the opinion of the authors, oxide of zinc is preferable for giving strength and resilience in the product.

The authors add that a good sample of lithopone should contain not less than 28 per cent. of zinc sulphide. It should be a good white, be smooth and free from coarse particles and have good binding power.

A NEW RULE OF VULCANIZATION. (*Abstract.*)

By A. O. Bourn, Providence, R. I.

THE rate at which the combination of rubber and sulphur increases or decreases with each increase or decrease of temperature, is a point naturally calling for investigation, a knowledge of which would be of great value to manufacturers, and would seem to be the foundation of a careful study of the subject of vulcanization.

To ascertain this ratio of increase or decrease, a large number of experiments were made previous to 1903, with the same compound and samples uniform in thickness in most well known processes of vulcanizing.

The experiments referred to were first made with a compound of 12 pounds dry fine Pará rubber, 6 pounds litharge, 6 pounds whiting and 6 ounces of sulphur, giving a proportion of about 3 per cent. of the latter. When these samples were submitted to the ordinary dry heat air process, physical vulcanizing effects were obtained approximately as follows:

15 seconds	at 337° F.	13 minutes	at 260° F.
23 "	" 326° "	26½ "	" 249° "
35 "	" 315° "	53 "	" 238° "
1 minute	" 304° "	105 "	" 227° "
2 "	" 293° "	210 "	" 216° "
3½ "	" 282° "	420 "	" 205° "
7 "	" 271° "	840 "	" 194° "

These results seem to establish the rule *that for each increase in temperature of about 11° F. during the vulcanizing operation, the velocity of vulcanization is doubled, and that with each decrease in temperature of about 11° F. the time required for vulcanization is doubled.*

Above 304° the rate of increase is different, there being a marked change in the physical constitution of sulphur; while below 194° the *air process* does not produce good results in vulcanization. In other processes down to 161°, there was no difficulty in effecting vulcanization.

The temperature above 304° showed following results: 325° F, 26 seconds; 350° F, 13 seconds; 375° F, 6 seconds; 400° F, 3 seconds. These and other experiments led to the view that a properly compounded rubber not only vulcanizes at all temperatures, but that vulcanization commences immediately upon the compounding.

In 1904, experiments were made with a view of testing the truth of the proposition that vulcanization proceeds at all temperatures. Accordingly samples of Pará rubber compounded with from five to seven per cent. of sulphur and fifty per cent. of litharge, were subjected to treatment at temperatures varying from 161° F. to 194° F. in a bath of metal, which fuses at about 150° F. The results confirmed the general rule obtained in the preceding experiments, with the exception that the time required for doubling the velocity of combination was somewhat greater for an increase of 11° F. in the temperature.

The results of embedding samples of the same compound in a ball of metal, and others in a jar of flowers of sulphur, showed that in seven months the former were thoroughly vulcanized, while in four months the latter were not fully so, but on being exposed to the air became strong and elastic. Samples of both are still available in a state of perfect preservation. The samples had been placed in a room with the average temperature of 110° to 115° F.

In February, 1912, another series of experiments was commenced on a line with those of 1904. Similar samples of a similar rubber compound and samples of four different grades of rubber shoe compounds, were placed in a ball of fusible metal, in a well-corked jar of sulphur, and in two tight jars; one containing a mixture of one part by weight of sulphur with five parts of litharge, and the other containing a mixture of equal parts by weight of sulphur, litharge and "Green Seal" French zinc. Samples of pure, fine Pará rubber, free from compounds or mastication, were placed in each jar.

Of the samples enclosed in fusible metal only one compound was properly vulcanized. All the others were vulcanized very perceptibly less than those embedded in sulphur, sulphur and litharge, or in sulphur, litharge and zinc. The action of litharge and sulphur, as compared with the action of sulphur alone, was very marked; the vulcanization of all the samples being carried much further than in the case of either of the other experiments.

An important deduction to be made from the new law of vulcanization and the experiments made in accordance with it, is, that the melting of sulphur has not the slightest effect in changing the rate of vulcanization. Whatever may be the time required to vulcanize a rubber compound at 227° F. it will vulcanize in one-half that time at 238° F, and in one-quarter the time at 249° F.

Moreover, vulcanization of rubber properly compounded proceeds at all temperatures, whether high or low. At high temperatures, the compound may be vulcanized in one second or less, and at low temperatures the vulcanization may proceed so slowly as to escape attention. Samples of these experiments can be examined at the Bourn factory laboratory, at Providence, by any one wishing to do so.

A BRIEF HISTORY OF FIRE HOSE SPECIFICATIONS IN THE UNITED STATES. (*Abstract.*)

By E. A. Barrier, of the Factory Mutual Laboratories.

AMONG the more important events which led to the development of the present Underwriters' Specifications for hose was the fact that previous to 1890 it was a matter of common occurrence for length after length to burst at pressures well under 100 pounds.

Steps in the direction of the needed improvement were first undertaken by Mr. John R. Freeman, then connected with the Inspection Department of the Factory Mutual Fire Insurance Companies, and now one of the foremost hydraulic engineers in the country, as well as president of several of the individual mutual companies. In experiments conducted in 1888, Mr. Freeman had found that with poor hose a pressure of 95 pounds would be required at the hydrant to produce a good fire stream, while the pressure needed with good hose would be about 73 pounds; 200 feet of hose being used in a line.

After a large number of tests and conferences the first set of Underwriters' Hose Specifications was published in July, 1896.

The clause requiring 40 per cent. of pure Pará gave rise to more discussion than any other in these specifications, but at the time and for several years after "Pure Pará" was understood to mean "Fine Pará." The whole idea was to obtain a list of manufacturers whose product could be recommended to mills insured in the Factory Mutual Companies. Any manufacturer desirous of being upon the approved list could send in samples for testing, and if they were found to conform with the specifications, his name was placed on the list without charge.

No changes were made until 1900, and they were then of no great importance. Meanwhile the National Fire Protection Association had been founded and the Underwriters' Laboratories established. In 1899, the National Fire Protection Association had adopted a set of specifications for hose, which were sufficiently different from the Factory Mutual Specifications of 1896 to cause some confusion among manufacturers. Seeing the de-

sirability of uniform specifications, a "National Standard" was adopted in May, 1902, in which only two important changes were made from the old specifications. One item, regarding the stretch of the rubber lining to five times its original length (which had appeared in the N. F. P. A. specifications) was omitted, and another item requiring a test of 200 pounds on each 50 ft. length, not originally in the Mutual specifications, was added. Since that time, the specifications of both organizations have been essentially the same, although their ideas regarding method of enforcement have differed widely.

The years up to 1911 were occupied with continual tests, during the progress of which, the paper states, evidence was accumulated that most manufacturers of hose were not turning out a product made in accordance with the specifications. The number and character of the analyses and tests gradually changed.

In 1906 the system of "Label Service" was developed by the Underwriters' Laboratories of Chicago, according to which an inspector would be stationed at the factory, and inspect every length of hose sent out; a label stating that the hose had been manufactured under the supervision of the laboratory, to which samples could at any time be sent for more detailed tests. Owing to several objectionable features which it was found impossible to have removed, in spite of a number of conferences, the "Label Service" has never been adopted by the Mutual companies.

Owing to the opposition of manufacturers, and their objections to using the labels, all those on the "Approved List" of the Chicago laboratories were dropped during 1909 and 1910. In the early part of 1911, however, two of them submitted samples to the Underwriters' Laboratories, which were approved, and adopted the "Label Service." Later in the year another manufacturer followed. At the present time, it is added, these three are the only ones using the labels. According to the system as developed, the rubber from the beginning of the manufacturing operations, until the hose is completed, is either in the inspector's presence, or under lock; the key being in his possession.

After a long series of conferences between the National Fire Protection Association and the manufacturers, a set of specifications was drawn up, which at the time was mutually satisfactory, and allowed a much lower grade of rubber than the present specifications. Owing to a misunderstanding as to their application these specifications were subsequently cancelled, when a much more stringent set was proposed at the annual meeting of the National Fire Protection Association in May, 1911 and formally adopted in May, 1912.

Meanwhile, the accumulated experience of the Factory Mutual Laboratories during the last five years, has shown, it is remarked, that much more stringent and definite requirements regarding rubber lining would have to be included in the specifications. A new set was drawn up in the fall of 1910, at the same time that the more definite specifications, already mentioned, were being prepared by the Underwriters' Laboratories for the annual meeting of the National Fire Protection Association of May, 1911. Owing to there being some differences between the two, a specification was finally drawn up satisfactory to both associations. This was formally adopted by the Factory Mutual Companies in December, 1911, and by the National Fire Protection Association in May, 1912.

Owing to various delays the Mutual companies have not yet put these new specifications into effect, but in the near future the manufacturers of Underwriters' hose will be notified that after a certain date, hose must be made in accordance with the new specifications; with which some manufacturers have voluntarily expressed their hearty concurrence.

The most important change made by the new specifications is a definite call for 40 per cent. "Fine Pará" instead of "Pure Pará." Tests are specified which the compound must meet, including acetone extract, free and total sulphurs, alcoholic potash extract, tensile strength, elongation and the so-called "permanent set."

Including this description of the work of the Factory Mutual Companies, which has apparently led to a settlement of the questions at issue, it is remarked that their only object is to make it possible for their members to obtain good hose. The work of testing and inspection is done without charge to the manufacturers and it has always been the intention to treat them fairly and to co-operate with them as far as they would allow.

NOTES ON TENSION TESTS OF RUBBER.

(Abstract.)

By P. L. Wormley, U. S. Bureau of Standards.

THAT the time is now ripe for co-operation between manufacturers and consumers, with a view to uniformity in tests and specifications for goods intended for the same purpose, is shown by the wonderful development of the rubber industry. In the same way uniformity of method is likewise essential for comparing the work of different laboratories; the standardization of specifications and testing methods being of substantial benefit to manufacturers, consumers and the public at large.

In each case, the refinement of the methods used should be determined by the nature of the material tested. In this respect rubber constitutes a most interesting field, uniformity in methods being more desirable than extreme accuracy in measurements; while the adoption of uniform testing methods would serve to prevent misunderstandings between manufacturers and consumers, arising from specifications being indefinite.

Opinions differ as to the relative merits of ring and straight test-pieces, the former involving several lengthy operations for their preparations, while the latter are instantly cut out by a single stroke of the die. The ring lends itself to the automatic measurement of elongation, having advantages over straight specimens. When, however, the strength of the rubber varies the ring gives a smaller ultimate elongation than a straight testing-piece. This difference is not always found, but the author's tests on twenty different compounds show a general tendency towards higher values for straight specimens.

With a view to the encouragement of the testing of rubber goods, the Bureau of Standards has constructed machines combining the greatest simplicity with a reasonable degree of accuracy. For determining tensile strength and elongation, they use an ordinary twin spring dynamometer, attached to the upper end of a metal column, a device being used for preventing recoil by holding the springs under the maximum tension. Two years of continuous service have proved the accuracy of these dynamometers.

As already mentioned, the measurement of elongation at rupture is less simple in the case of a straight test piece than with a ring, but a little practice obviates this difficulty.

Owing to the author's experience of the time consumed in testing the recovery after extension, he constructed an apparatus for testing six specimens at once.

Of the tensile machines seen in operation by the author, or studied from illustrations, some appear better adapted to experimental or research work than to routine testing, this being partly due to their delicate or expensive construction, and their slower operation.

It would be difficult to obtain by autographic means tension or hysteresis curves for straight test pieces, but another slow, yet otherwise satisfactory method exists of securing curves, that is, by means of a narrow flexible scale of paper or tracing cloth, attached to the test piece by a small spring wire clip. From this scale, one operator reads the elongation at convenient intervals. With a little practice this process becomes exceedingly simple, the curves given clearly showing the characteristics of different rubbers.

The tension test, which is the most widely applicable for soft rubber products, is used to determine strength, ultimate elongation, and elasticity or recovery. The results of tests are influenced by:

1. Shape and size of test pieces.
2. Method of preparing and measuring same.
3. Design of grip.
4. Direction in which test pieces cut (in straight specimens).
5. Temperature.
6. Previous stretching.
7. Time allowed after extension and release before measuring set.
8. Speed at which rubber is stretched.

Other important considerations affecting test pieces are: Preparation and measurement; design of grip; direction of cutting; temperature; influence of previous stretching on strength and elongation; increase of ultimate elongation and strength.

An objection to the practice of attempting measuring and remarking specimens immediately after release, is the influence thus exercised on the second set by the few seconds interval which necessarily takes place.

The author's aim has been to deal with uniform methods of testing, no attempt having been made to treat the general subject of physical testing in an exhaustive manner.

TESTING OF AIR BRAKE HOSE AND ACTUAL SERVICE. (*Abstract.*)

By G. E. Bishop.

THE above subject is treated by the author in two sections—air brake hose and steam heat hose. In the former two sizes are considered—1½ in. x 22 in. and 1¾ in. x 22 in. The first of these is for use in passenger service and the second on freight cars only, the hose being specified to stand a bursting pressure of 500 pounds per square inch for 10 minutes. At 200 pounds pressure it must not expand in diameter more than one-quarter inch, or change more than one-quarter inch in length. It has also to stand a friction test of such a nature that with a weight of 25 pounds suspended from the end, the separation would be uniform and regular; the average speed not exceeding 6 inches in ten minutes; as well as a stretch test, between marks two inches long on a piece half an inch wide. This is quickly stretched until the marks are 10 inches apart and released; then re-marked as at first and again stretched to 10 inches; remaining ten minutes without breaking. After release the distance between the marks must not show a permanent set of more than one-quarter inch.

Several interesting tables are appended to the paper, showing in the first place the performance of 1½ in. air hose during the year from November, 1911, to November, 1912. The table includes the number of hose removed for all causes, classified under the general causes for removal and the life of the hose. The total number of hose purchased of each of the eight makes used during a period of three years is also shown as an indication of the proportion of the different makes of hose in service. This point is illustrated by the numbers of each make inspected and rejected.

A large portion of the hose was removed on account of being damaged in service; this being largely attributed to the automatic connector, which increased the chafing and cutting of the hose. The results given by the eight makes are criticized in detail.

Another table deals with similar particulars as to the 1¾ in. air hose, the two tables constituting a detailed history of the performances of the two sizes of air-hose during the twelve months ending November, 1912.

In the second part of the subject, steam heat hose 1¾ in. x 24 in. is dealt with, used on passenger cars, locomotives and tenders, with an automatic connector, as referred to under the discussion of air hose. The tests include the elongation and ultimate tensile strength of a piece of the inner tube. A friction test provides for the pull at which the duck will start to unwind, while the sample is likewise subjected to saturated steam at a pressure of 45 pounds per square inch for a period of forty-eight hours. After cooling, the tests are repeated, when the stretch test must not show a deterioration of more than 30 per cent. and the tensile friction not more than 20 per cent. Inspection of the hose after removal from the digester must not disclose swelling, blisters or loosening of inner tube.

A performance table records the results on the same principle as those shown for air hose.

In conclusion, the fact is referred to that purchasing under proper specifications has decreased consumption of hose per car per year from 4.3 pieces to 2.5 pieces.

It is thought that better steam hose can be procured by increasing the friction and stretch test. A specification is now being tried with the requirements, after the digester test, increased to what they were before that test.

RAILROAD AIR BRAKE HOSE. (*Abstract.*)

By J. S. Sheafe.

WHILE the requirements prescribed by the Master Car Builders' Association are intended to insure uniformity of standard in railroad equipment, the air brake hose now being manufactured does not comply with those requirements in other than the physical tests.

The M. C. B. specifications prohibit the use of rubber substitutes. Neither pure rubber nor a fair grade of rubber can be used at the price paid.

Air brake hose to-day are poorer than formerly, for which both the railroads and manufacturers may be blamed; the former for continually hammering down the price asked for an honest article, and the latter for consenting to attempt the manufacture of an article at a price below that which they know can be fairly met. The quality of air hose must be improved by the co-operation of manufacturer and consumers.

Air hose is sold as low as 30 cents a foot and as high as 50 cents, there being thus a difference of 66 per cent. How much can be expected of a quality costing the minimum? The cost of replacing poor hose would make up for the extra price of a good quality.

The largest number of failures has resulted from outside injury, not attributable to inherent weakness of the hose.

There can be no doubt of the deterioration of the average air hose within six months of manufacture. The making of hose to wear well, is the most important part of the manufacturers' problem. Rubber manufacturers could make a lasting hose by compounding a tube and cover with just as much or little flexibility as would be necessary for long life. If the manufacturers will produce a hose with an inner tube and cover able to withstand the action of time and weather for 36 months at a commensurate price, the whole situation will be greatly improved.

CONTRACTS. (*Abstract.*)

By Arthur W. Stedman.

COMMON law presupposes that, in making a contract, both parties have agreed upon the same thing. A contract should be so drawn as to be enforcible by law, and should embody a consideration, whether in the form of some actual object or service, or under the guise of "one dollar and other good and valuable consideration."

The chief points to be defined are: First, an agreement as to what is being purchased; second, an expressed or understood standard of quality, and third, delivery at a certain time and

place. The point at which the seller's responsibility ends and that of the buyer commences, should also be defined, as well as the mode of settlement.

Since all contracts are not carried out, it is a wise precaution to stipulate the course to be pursued, in the event of violation by one or other of the parties.

Rubber purchases include two forms: "spot" and import transactions. In the former the chief risk is a difference between the samples and the bulk of actual rubber, at New York, London, Liverpool, Antwerp or other central points. Forward rubber contracts, on the other hand, are based on standard classifications, in accordance with which the importers agree to make certain deliveries, in New York or at the mills. Such business whether for early or deferred delivery needs the safeguard of a contract, protecting alike buyer and seller.

The principal features of the Standard Rubber Contracts for forward orders, adopted by Liverpool and London, include detailed provisions as to the three points of Tendering, Inspection and Arbitration. In addition to these, the question of the shrinkage is a serious one for manufacturers. It has a parallel in the case of wool, where in some cases the importers guarantee a maximum rate of loss. The silk trade affords an instance of the moisture being adjusted. The importance of this question to the rubber industry is indicated by the quicker time in which rubber now reaches New York, and the larger percentage of moisture it now contains, than was formerly the case.

Attention has been paid in Europe to the question of standard grades of plantation rubber, to which planters would conform. Forward orders extending over 1913 have largely been for well-known grades of plantation rubber; the more general adoption of this system having been suggested. The Silk Association of America, among others, has given attention to the question of forward contracts.

The chief points to be covered in arrangements regarding standard rubber contracts would be as follows:

1. The seller draws up, signs and sends a contract to the buyer, stating conditions of sale. Formerly, silence on the part of the buyer was taken to mean acceptance of the contract, but it was found that misunderstanding resulted, and now it is the uniform custom for the seller to send to the buyer two signed contracts, one of which he keeps and one of which he returns with his acceptance written thereon.

2. Any objection to the terms expressed in this contract must be made immediately upon receipt, and any changes must be in writing, signed by both parties.

3. Provisions should be made for delays in transportation. If the rubber is shipped by a steamer due to arrive at port of destination within the contract period, buyer must accept delayed delivery upon receipt of proof of sailing and cause for delay.

4. If any part of the rubber is lost at sea, contract to be voided for that portion.

5. The rubber becomes the purchaser's property as soon as it leaves the seller's hands, the buyer paying the freight and cartage.

6. Seller's responsibility for goods in transit ceases when they pass into the hands of the transporting company. Stealage or other loss while en route is at the buyer's risk.

7. If shipment is questioned as to quality, and if bought by sample, this is compared, and in case of dispute (to be decided by arbitration), the losing party to pay the costs of arbitration.

8. The buyer is not allowed to select the good and reject the bad from any lot; he must take all or none.

9. If the seller fails to make delivery on or before the last week-day of the month specified, and no proof is offered that the delay was from causes beyond seller's legal control, the buyer can enter the open market and purchase, charging any loss to the seller.

The fair-minded seller means to deliver what he has bargained to supply, and the honest buyer means to accept and pay for what he agrees upon. It only remains therefore, to find and agree upon fair and equitable terms and conditions which will prevail and become known the world over, as the usual basis upon which rubber is bought and sold.

FARMING BY DYNAMITE. (*Abstract.*)

By Harold Hamel Smith, Editor of "Tropical Life."

WHILE the author had long suspected the possibilities of explosives in connection with agriculture, it is only within the last year that he has been able to demonstrate how very useful dynamite (and the other "ites") can prove for that purpose, when used with discretion, by natives or Europeans. Any race, sufficiently intelligent to tap rubber trees, could, in his opinion, be trained to handle these explosives, under the same class of white direction as with rubber tapping.

For twenty or thirty years past, farmers in the western states of America have regularly blasted their ground, and thereby obtained bumper crops, while leading journals have opened their columns to a discussion of the matter.

Dynamite, or another explosive if more suitable, can be advantageously used in agricultural industries for the following purposes:

1. To break up hard or virgin soil, particularly the under crust, which no ordinary plough could penetrate.

2. To blast out boulders, rocks and tree stumps, leaving the ground in a state to be easily and properly ploughed.

3. To clean the soil of pests, and destroy ants' nests or rabbit warrens, and to regenerate and aerate hard or worn out soils generally, such as West Indian soil which is not ploughed, but only hoed; the hard-pan sub-soil being left till it becomes waterlogged and dangerous.

4. For throwing up soil for drains, especially deep gullies, to be removed by hand plough.

5. For making holes for tree planting, and loosening the soil for fence post holes.

6. For well-boring, or well torpedoing, the latter being for the purpose of increasing the flow from an artesian well.

Doubtless other uses will be found for explosives in connection with estates, the author referring to their use for removing masses of rock or soil for making estate roads. The latter, it is added, is too big and dangerous a work for the average planter, and should not be carried out without consulting an expert. The use of explosives in connection with mining is referred to as a separate branch of the subject.

While explosives advantageously supplement ploughing, they do not obviate the necessity of the latter. As the "Queensland Agricultural Journal" remarks, the plough must be used just as ever; the only difference being that dynamite expends its disintegrating force in the sub-soil, which is never touched by the plough, so that one is not merely planting the crops in the same soil year after year. By the use of dynamite the crops are enabled to draw up their nutriment from below, the clay strata being broken up and the accumulated and stagnant water being allowed to pass through. At the same time myriads of harmful lives are destroyed.

Another point of importance is the need of a regular adequate supply of water at all times, if good crops are looked for, in order to enable the plant food to nourish the trees or plants. This point is one of the advantages of farming by dynamite. This last named principle, as the "World's Work," of London, lately wrote, "has gripped the United States and is speeding through Canada like a prairie fire."

The Queensland "Agricultural Journal" has recently published various practical details as to the system. The "Times of Ceylon" has also dealt with the matter, with special reference to the trial of the plan by a Kelani Valley rubber planter. The editor of "Grenier's Rubber News," of Kuala Lumpur, lately wrote that the consensus of opinion, at least among planters of the Federated Malay States, is that clean clearing, which means the removal of

all stumps of timber, is of paramount importance, for the expeditious and economical accomplishment of which work there is in dynamite an adequate material. According to the "Home and Colonial Mail" experiments are becoming quite popular in South Africa of ploughing by dynamite.

All the leading papers in the rubber producing world, as well as those devoted to planting interests elsewhere, recommend attention to the use of dynamite for estate work. Its employment especially appeals to the author, in connection with Latin America where the transport of even the lightest make of ploughs is difficult, costly and often impossible. In fighting locusts and various other pests, organized explosions tend to their reduction at all stages, whether in the soil or as grubs flying over it.

The author quotes a letter to the "Times of Ceylon" from Kalkudah in the Eastern Province of the island, referring to the advantages of using dynamite for breaking through the slabs of coral which run from the coast to one and a half miles inland. This coral runs from 2 to 9 feet below the surface, and measures in some places from 18 to 24 inches in thickness.

In conclusion the author remarks that there is no doubt explosives have not only come to stay as a necessary auxiliary to modern agricultural science, but that their use will extend on all sides until they occupy a prominent position in rubber planting and other branches.

POSSIBLE RUBBER PRODUCERS IN THE TEMPERATE ZONE. (*Abstract.*)

By Charles P. Fox.

WHILE the production of rubber in the temperate zone has been regarded as possible, its probabilities are remote and dependent on many conditions. Some of these are: Demand; cost of production; grade of product; influence of supplies of natural and plantation rubber; and the ever recurring spectre of synthetic rubber.

From his investigations extending over fifteen years, the author has found several rubber producing plants suitable for the various sections of the temperate zone. Among foreign plants were *Atractylis and Eucommia,* the most interesting specimen being the *Eucommia ulmoides,* or "Chinese Rubber Tree," said to be hardy in New England. This source of rubber was found only suitable for ornamental forestry. Of native plants, those of possible value as rubber producers are members of the *Asclepiadaceae, Apocynaceae* and *Compositae* families.

Of the true milkweeds, only one is of any importance, *Asclepias Cornuti,* which is very abundant and contains a quantity of milky juice producing 3 per cent. of fair grade rubber. The cost of collecting the latex is, however, prohibitory. The common Indian hemp, *Apocynum Cannabium* is less abundant than milkweed and produces less latex, but the quality of the rubber is better. The third native group named, that of the *Compositae,* include *Souchus* or Sow-thistle, producing an excellent grade of rubber, which is the subject of a German patent of 1885. It grows on a dry barren soil.

Two species of wild lettuce, *Lactuca Canadensis* and *Lactuca virosa,* both produce a thick latex containing rubber. Another promising plant of the arid region is "Strockle's Rubber Bush," a robust member of the *Compositae* family.

As to the arid section of the Temperate Zone, it is amply provided with guayule (*Parthenium Argentatum*) pingue, greasewood and *Candelillia.* It is stated that since the first of these can be successfully grown in Mexico, it should thrive equally well in the Southwest of the United States. Pingue (*Actinella Richardsonii*), with less rubber than guayule, has superior advantages in other respects.

Nevada greasewood contains rubber, as shown by Ellis and Warner's patents of 1902. A large amount of this plant is reported to be available.

In North Mexico and the Big Bend country of Texas there is an immense growth of *Candelillia,* producing rubber and wax, the latter being used in making hard rubber.

Some 15 years ago rubber growing was attempted with *Ficus elastica* in Key West, Florida, but proved a failure, the conditions being too dry and the soil shallow.

The same tree has grown to a large size in the deep, fertile and moist soil near Miami. Rubber as good as the Mexican "Amate" rubber has been grown on a small scale at Palm Beach. Florida, with its large available area of soil suitable in character, seems to offer specially good prospects for rubber cultivation.

While the other plants named are of interest from a botanical point of view, the author considers that only two, guayule and pingue, contain enough rubber to insure profitable working. It is for experimental stations to continue the work of developing the others.

THE PLASTOMETER, A RUBBER TESTING INSTRUMENT (*Abstract*).

By B. Denver Coppage (Wilmington, Del.)

THIS instrument, designed for the use of its manufacturers, the Pussy and Jones Co. of Wilmington, Delaware, is intended to define the plasticity or density of the rubber covered rolls used in paper manufacture. These rolls have to be selected suitable to the paper to be made.

Since the adoption of this instrument there is no uncertainty as to the conformity in plasticity of the rolls with the samples chosen. Plasticity also indirectly indicates elasticity, softness and hardness, density, resilience, etc.

In the plastometer a weight is supported upon a sphere, the penetration of which into the material at the expiration of one minute can be determined. For instance, most grades of commercial rubber may be tested with a hardened steel ball ¼ inch in diameter and a weight of one kilogram. The penetration or indentation of such a ball is indicated to 1/100 of a millimeter. The softer materials would require a larger ball or less weights, or both. The harder materials would require a smaller ball or more weight, or both. Certain very hard materials would possibly require a longer application of the weight than one minute, while certain very soft materials would require less than a minute to obtain satisfactory indications.

The possibility is discussed of utilizing the plastometer for establishing a standard scale of qualities for rubber and for the determination of raw rubber values. The plastometer is used by many leading rubber manufacturers in this country, and by users of paper making machinery at home and abroad. It has so far been developed by a buyer of rubber, while its further development for the benefit of that trade will undoubtedly depend upon the engineers and chemists directly connected therewith.

THE VARIOUS MANIHOTS PRODUCING RUBBER IN THE CENTRAL STATES OF BRAZIL (*Abstract*).

By Dr. J. Santiago Cardwell-Quinn.

DR. CARDWELL-QUINN has contributed an interesting and exhaustive treatise on this subject, but he was not able to submit it in time to be read at the conference; and in fact it was not received by the secretary of the conference until a few days ago, and too late to make it possible to present an adequate abstract of it at this time. It will be reproduced in full in a later issue, and will prove a valuable contribution of the literature of the *Manihots.*

Gutta Percha in Kaiser Wilhelm Land.

NEW GUINEA, the vast island immediately to the north of Australia, is like ancient Gaul, divided into three parts. The western part belongs to Holland, the southern portion to England, and the northeast to Germany (Kaiser Wilhelm Land).

Special attention was directed to the latter by the expedition in 1907-9, organized by the "Kolonial Wirthschaftliches Komitee" (Colonial Economic Committee), the report of which has appeared, after having been for a long time in preparation. It has been compiled by Dr. R. Schlechter, the botanist, who was in charge of the expedition.

The following were the objects of the expedition:

1. Determination of the quantities of gutta percha and rubber worth gathering.
2. Gathering of these crude materials.
3. Instruction of natives as to their gathering.
4. Preparation for and development of gutta percha and rubber cultivation.

The necessary funds were provided by the German Colonial Company, the Colonial Administration, and by the German rubber manufacturing industry.

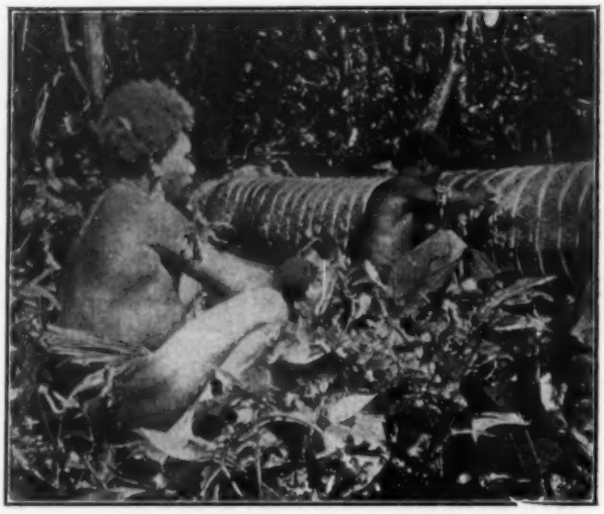
The expedition reached Kaiser Wilhelm Land on March 12, 1907. From that time until February, 1909, the party remained in the central part of Kaiser Wilhelm Land. They then passed several months in the Waria valley; later on visiting the west-

MAKING CHANNELS ON TRUNK OF A GUTTA PERCHA TREE WITH HOLLOW CHISEL.

ern part of the protectorate and leaving New Guinea late in the year. The results of the expedition are classified into the following heads: gutta percha, rubber, other useful plants; botanical and geographical points.

GUTTA PERCHA.

As far as positively known, there are in the Protectorate of New Guinea, two principal varieties of *Palaquium*, which produce a marketable gutta percha. The first of these, which may



COLLECTING GUTTA PERCHA MILK.

be designated red gutta percha, has been designated by Dr. Schlechter as *Palaquium Supfianum*. The second, as yet undescribed, differs from the first by the baldness of its leaves. This description it is proposed to call *Palaquium Warburgianum*.

Palaquium Supfianum is a tree which attains the height of 100 to 130 feet. The diameter of the trunk approaches 6 feet. The *Palaquium Warburgianum* is very similar to the first-named variety, but grows more quickly and has a greater diameter. Regarding the habitat of the *Palaquium Supfianum*, the expedition found it in almost every region visited, chiefly at an altitude from 300 to 2,500 feet above sea level. It apparently prefers hilly locations, but is also sometimes found in low situations. It favors well drained land, and seems to avoid all places where there is stagnant ground water.

TAPPING.

With a view to defining the best method of tapping, Dr. Schlechter made trials of all the known methods. These were made of horizontal cuts, oblique and vertical cuts, and long and short incisions of various lengths, partly upon trees standing in the forest and partly on those already felled. From these various trials it was seen that the quantity of gutta percha gathered did not pay for the amount of work involved. The extent of these trials led Dr. Schlechter to the conclusion that under the circumstances, the ring methods employed in the Dutch Indies, particularly Sumatra and Borneo, were the only profitable ones, much greater quantity of gutta percha being obtained than by any others.

As soon as a gutta percha tree is found which appears worth tapping, and before the tree is felled, it is estimated in what direction it will probably fall. The forest is partially cleared on the side in question, short trunks of trees being laid crosswise, in order to prevent the tree from falling directly on the ground. The short trunks placed crosswise allow of the more convenient use of the cups placed beneath for collecting the milk, and allow of the rings being brought around the whole

of the trunk, a larger quantity of milk being thus obtained. As soon as the tree has been felled, the rings are cut at distances of about 12 inches apart, around the whole of the trunk.

For the making of these grooved rings, a gutta percha knife

COAGULATING GUTTA PERCHA MILK BY BOILING.

was used by the expedition, such as was already in use by Malay tappers in Borneo and Sumatra. These knives had in general the form of a hollow chisel.

The grooves cut out had at the upper edge a width of about an inch, and were cut deep enough to reach the cambium layers. Otherwise a limited yield of milk would result.

GATHERING.

While some of the workers were engaged in making the rings on the trees, others were placing under each ring one or two receptacles into which the gutta percha dropped, so far as it had not begun to coagulate in the grooves. For convenience and economy, these receptacles were made on the spot from palm leaves, or other leaves of leathery texture. As soon as the milk ceased to fall, which usually took place in 15 to 20 minutes, the contents of the receptacles were emptied into large vessels, to be boiled, coagulated and pressed into gutta percha. When water was available it was found desirable to add some to the milk, as the latter was thereby to some extent washed,

KNEADING AND PRESSING GUTTA PERCHA CAKES.

and the particles of resin could thus be removed in the watery residue. The milk coagulated in boiling in about ten minutes.

COAGULATION.

After trying various methods of coagulation, Dr. Schlechter was obliged to revert to the plan of boiling already in general use in Borneo and Sumatra, as being the only system adapted for forest purposes.

TIME OF TAPPING.

The time of tapping was investigated on various occasions. Trees tapped on the day of felling did not show any noticeable difference as compared with those tapped immediately after being cut down. Even after three days the milk flowed well, but it had begun to thicken and coagulation had evidently commenced. A week after felling, the yield was very small, as the bulk of the milk had coagulated. Trees tapped in the morning gave better results than those tapped in the afternoon.

The observation of a number of trees extending over several months, indicated that after heavy rainfall, gutta percha milk flowed much more thinly than after the lapse of several warm days without rain.

AGES OF GUTTA PERCHA TREES.

Owing to the fact that trees exposed to light and air often form more than one ring a year, while those in dark locations form less than that average, Dr. Schlechter remarks that rings do not indicate with certainty the age of gutta percha trees. He adds that it is unadvisable to tap young trees. He has usu-

RUBBER READY FOR SHIPMENT (ABOUT 4 LBS. DAY'S WORK FOR 6 NATIVES).

ally tapped only such trees as have at a height of 40 inches a diameter of at least 12 inches. In many cases, however, the yield was small.

PROGRESS OF GUTTA PERCHA GATHERING.

The gathering of New Guinea gutta percha has been considerably developed, owing to the energy of the German government, and is being carried on by natives, under the guidance of Malay experts, brought for that purpose from Sumatra. Being forced to earn so as to pay their "cottage tax," these natives have overcome their natural indolence. Gathering gutta percha being an occupation which brings them in money, they have every inducement to follow it. The government buys all the gutta percha the natives bring in at a price equaling about 11 cents per pound.

ADVISABILITY OF GOVERNMENT PLANTATIONS.

From the results of the expedition, Dr. Schlechter advises the German Colonial Government, following the example of England, Holland and France, to establish gutta percha plantations in New Guinea, the climate of which is more suitable for the purpose than that of the other German colonies. These plantations, when found to be profitable, might serve as a plant-

ing school for private undertakings, being thus in a position to always supply the requisite quantity of seeds at the right time.

STORAGE AND SHIPMENT.

On the coast there had been erected a special storage warehouse with a cemented basin large enough to hold about 4 tons of gutta percha. After being prepared in the forest, it was brought to the coast in bags by the first opportunity, being kept cool and shaded from the sun's rays. On reaching the coast it was stored in the above-mentioned basin and kept under water up to the time of shipment, the basin being boarded over in order to be kept in darkness. Ample ventilation was, however, provided.

NEW GUINEA'S RUBBER VINES.

Dr. Schlechter discovered six rubber vines, of which only four have been technically described, belonging to the *Apocynaceae*. The most important of these is the *Parameria Wariana*, of the Waria territory, which is very long and often as thick as a man's arm. It often climbs into the tops of the highest trees, from which it spreads over several others. The branches are very

PRIMEVAL FOREST ON THE UPPER MOROBE RIVER, IN WHICH THE *Parameria Wariana* VINE IS FOUND.

slim and have a large quantity of leaves. Besides these four *Apocynaceae* there are two *Ficus* vines in Kaiser Wilhelm Land: *Ficus Hypaphaca*, and *Ficus Supfiana*. In the annexed illustration is shown a forest on the upper Morobe river, in which the *Parameria Wariana* rubber vine is found.

The report is supplemented by some effective illustrations, a few of which are herewith reproduced, showing the various stages in the gathering and preparation of gutta percha in Kaiser Wilhelm Land.

RUBBER PROSPECTS IN PORTUGUESE EAST AFRICA.

THERE is every reason to believe that rubber will soon become an exceedingly important industry in Portuguese East Africa. The rubber forests are extensive, and the *Landolphia* vines from which the rubber is extracted are profuse. With organization and working capital there is no reason why the export of rubber should not jump within two years to over 500 tons annually. While the percentage of rubber to waste in the vines is small as compared, for instance, with the output of latex from a young Ceara tree, the abundance of the vine and its remarkable powers of recuperation are factors which more than make up for the low percentage of rubber to waste.

THE WORLD'S PRODUCTION AND CONSUMPTION OF RUBBER.

In July last, it will be recalled, Mr. Arthur Lampard, chairman of the Rubber Plantations Investment Trust, estimated the current year's production as about 91,000 tons and the consumption as about 103,000 tons. Closer data now available enabled him at the December meeting of the United Serdang Rubber Plantations to revise his estimates, which now stand respectively at 104,700 and 108,250 tons.

Details of the estimates are as follows:

PRODUCTION, 1912.	July Estimate. Tons.	December Estimate. Tons.
South America (East Coast)	39,000	40,700
South America (West Coast)	.....	2,000
Central America and Mexico	5,000	5,000
Africa	15,000	15,000
Assam, Rangoon and Borneo	2,500	2,500
Guayule and Jelutong rubber	.....	10,000
Plantation	28,500	28,500
All other sources	1,000	1,000
Total tons	91,000	104,700

CONSUMPTION, 1912.	July Estimate. Tons.	December Estimate. Tons.
America	47,500	48,000
Great Britain	15,000	17,250
Germany	15,000	16,000
France	10,000	10,000
Russia	7,000	7,000
Belgium	1,500	2,000
Other countries	7,000	8,000
Total tons	103,000	108,250

The increase in figure of production is in great part only apparent, chiefly arising from guayule, and jelutong rubber having been omitted in the July estimate. With that rectification the quantities would stand thus:

	July Estimate. Tons.	December Estimate. Tons.
Production	101,000	104,700
Consumption	103,000	108,250
Excess of consumption over production	2,000	3,550

Increased consumption is thus shown; the excess of consumption naturally finding its level in the position of the visible supply, which illustrates Mr. Lampard's figures. On November 1, 1911 it stood at 11,104 tons and on November 1, 1912, at 8,818 tons; the reduction having been 2,286 tons in the twelve months. By December 1 it had been further reduced to 7,832 tons, the falling off being 3,272 tons; this figure practically corresponding with the estimate of an excess of consumption in 1912 over production of 3,550 tons.

These figures bear out Mr. Lampard's contention, that consumption is going ahead quicker than production.

DIVIDENDS PAID BY THE HIGHLANDS AND LOWLANDS CO.

The Highlands and Lowlands Para Rubber Co., Ltd., whose plantation is in the Federated Malay States paid a dividend of 50 per cent. during 1910, and interim dividends of 22½ per cent.; with a final dividend of 15 per cent., making 37½ per cent. in 1911. It also paid two interim dividends in July and October of 1912—aggregating 15 per cent.

The Rubber Industry in Hawaii.

SEEING the favorabie results of recent analyses of Hawaii rubber at New York, interest attaches to a special detailed report on the subject of the Hawaiian rubber industry, by Mr. E. V. Wilcox, Special Agent in Charge at the Hawaii Agricultural Experiment Station, Honolulu. The report covers the ground very thoroughly, dealing with cultivation, methods of tapping, the questions of rainfall and altitude, the most effective measures for combatting the ravages of pests and a comparison of *Hevea* and Ceará as desirable trees for the Hawaiian Islands. It begins with a description of the area now under cultivation.

AREA NOW UNDER CULTIVATION.

There are at present about 1,500 acres under rubber, and as further plantings are contemplated, there is a possibility of this

FOUR YEAR OLD CEARA TREES.

acreage being considerably enlarged. At the present there are in all about 1,200 acres planted in Ceara, and 300 in *Hevea*. Organized planting dates from the year 1905, though rubber trees as old as 20 years are to be found in the territory.

Five companies operate the principal part of the industry, with the following planted holdings:

	Established.	Capital.	Rubber acreage planted (approximately).
Nahiku Rubber Co.....	1905	$150,000	480
Hawaii American Co.....	1905	50,000	245
Koolan Rubber Co.....	1906	30,000	275
Nahiku Sugar Co.....	1906	.....	250
Pacific Development Co..	1907	80,000	250
Total	....	.....	1,500

The Pacific Development Co. contemplate ultimately increasing their planted acreage to 600 acres.

In addition to these large companies there are about a dozen small plantings, aggregating about 50 acres, so that the total area specifically devoted to rubber is about 1,550 acres.

The rubber companies of Hawaii have so far been operating with local capital, and have been trying to demonstrate the rubber possibilities of the territory. At present there are too few trees of tapping age to allow of a definite statement of cost or profit. The results of the tappings at the experimental station, and of those made as trials by the managers of the different plantations, agree to such an extent, that as long as the market price is from 75c. to $1 per pound, satisfactory results may be anticipated from plantings of Ceara rubber in Hawaii.

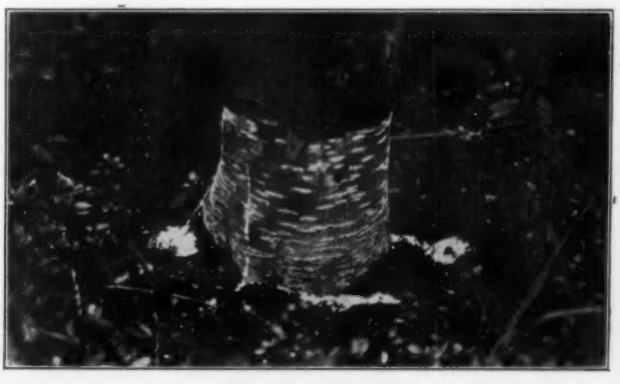
BENEFITS OF CULTIVATION.

It was at first thought that rubber trees would grow sufficiently well without cultivation, but it was soon found that the cost of cultivation was made up for by the more rapid growth of the trees. Cultivated trees at two or three years of age are, on an average, larger than uncultivated trees at five or six years of age. By the adoption of a suitable method of cultivation, at least two years could be cut off the period of waiting for trees to come to maturity. Cultivating the trees seems a necessity under Hawaiian conditions. The unusually rough nature of the land, and the tangle of shrubby undergrowth rendered horse cultivation out of the question, while the cost of hand-cultivation promised to be extremely high. Recourse was had to chemical spraying for destroying the weeds. Sulphate of iron was fairly satisfactory, but arsenite of soda gave much better results and has been generally applied. The cost of spraying is from $1.25 to $2 per acre. As soon as the woody growth is killed, the soil can be readily tilled; the tillage and the action of the sun bringing about the oxidation of the soil, thus greatly improving its physical and chemical properties.

TAPPING.

Tapping experiments were begun on trees at two years of age and have been continued. During the present season about 50,000 trees are being tapped, and from these a considerable amount of rubber will be extracted. Of the various methods used, the half herring-bone system is perhaps the most promising. On account of the Ceara dropping its leaves annually, it seems desirable in Hawaii to allow the trees complete rest from February to May.

Of the various receptacles for catching the latex, the ordinary Japanese tea cup has given the most satisfaction. The flow of latex is best from daylight to ten o'clock, the cost of tapping depending largely upon the experience of the worker. After a few weeks' experience, a man can readily tap twice as many trees as at first. The oldest trees experimented upon are about five years old. From such trees it is possible to obtain a pound of dry rubber for each 100 trees at a single tapping, and at present price of labor, a pound of rubber seems obtainable at a cost of 50 cents. This can probably be reduced as the men acquire greater experience.



TAPPING METHOD.

RAINFALL.

In the regions where rubber is chiefly grown in Hawaii (the Nahiku district of Maui and the Puna district of Hawaii), the rainfall is rather high (100 to 200 inches a year). Most of the land is exceedingly porous, particularly in Puna, where the

soil is underlaid with a peculiar broken lava. Thus even the heaviest falls do not produce running streams of water.

ALTITUDE.

The Hawaiian rubber plantations are situated from near sea level to the height of about 1,400 feet. Rubber plantations are mostly on the windward side of the islands, where the rainfall is much higher than on the leeward side. Ceara rubber appears to thrive well at the highest level at which it has been planted, but *Hevea* seems to be more susceptible to the lower temperatures of the higher altitudes.

INTERPLANTING.

On the Maunawili ranch, the cultivated area, of which is largely devoted to coffee, several thousand Ceara trees have been planted at regular intervals among the coffee.

PESTS.

No serious pests have been encountered in Hawaii. Seedlings are sometimes attacked by cut-worms, but these pests can be controlled by the use of poisoned bait or by sections of bamboo stems being placed around each young plant. The ravages of tree rats have been controlled, as a result of the thorough cleaning up accomplished by spraying. There is a tendency for a shot-hole fungus to become troublesome on *Hevea* leaves.

THE WAY IT IS COLLECTED FROM BASE OF TREE.

AFTER GOING THROUGH WASHING MACHINE.

READY FOR SHIPMENT TO NEW YORK.

CEARA VS. *HEVEA*.

The first plantings of rubber were almost exclusively Ceara, this species having given satisfaction in Ceylon as to growth. With the increased planting of *Hevea* in the Orient, a livelier interest was manifested in Hawaii regarding that variety, and all the plantations put out experimental plantings of that kind. It was thought that its large yield would make up for its slowness of growth. *Hevea* has, however, grown so slowly that the tendency is at present again in favor of Ceara. In addition to the ordinary Ceara (*Manihot Glaziovii*) experimental plantings have been made of *M. Dichotoma* and other species of this genus.

CEARA RUBBER.

Rubber experts who have examined the samples submitted of Ceara rubber from young Hawaiian trees, have never made the value more than 10 cents below that of the finest plantation Pará from Ceylon. The fact that Ceara has come largely from wild trees and has been collected by careless methods, has placed it in a position below its real value, on account of the unfavorable impression created by its appearance. Practical tests show it is slightly inferior in tensile strength to the best plantation Pará, and that it is a little high in resin contents. These defects may be partially due to the Hawaiian trees being young, which would render them likely to contain more resin than should be found in the latex of older trees. Even prepared without special care, Ceara rubber keeps in good condition for two years or more, without losing its tensile strength or developing especially disagreeable odors.

For some time past it has been felt that a combination of all the rubber interests in the island of Maui would be a decided advantage, and a strenuous effort is being made to bring about such a combination. Three of the largest companies have combined to the extent of employing the same manager for the three concerns. Whether or not a combination is made, it is certain that there will be one factory, and that the Hawaiian rubber which comes on the market in the future, will be of uniform quality and standard. The methods thus far used in preparing the rubber do not involve the use of any chemical, either in tapping, coagulating or washing. It has been found possible, by observing care, and by washing in water and passing through simple rollers, to obtain a clear rubber of firm consistency and good light color.

The manager referred to as being in charge of three companies is Mr. Wilbur A. Anderson, general manager of the Nahiku Rubber Co., Limited; Hawaiian-American Rubber Co., Limited, and Koolan Rubber Co., Limited. He is also superintendent of the Rubber Sub-station, United States Experimental Station, Honolulu, and was commissioner to the recent exposition. To his courtesy THE INDIA RUBBER WORLD is indebted for Mr. Wilcox's report, the leading points of which have been reproduced above.

The New York analysis of Ceara rubber grown in Hawaii, referred to above was as follows:

Loss in Washing and Drying.	Tensile Strength.	Stretch.	Resin.
½%	1710	15¼"	3.98%
⅔%	1660	15"	4.00%
1%	1660	15"	2.12%

Messrs. Alexander & Baldwin, Limited, of 82 Wall street, are the New York agents of the three companies under the management of Mr. Anderson.

RUBBER VS. LUXURIES.

THE value of crude rubber imported into the United States during the year 1912 is estimated at $100,000,000—a very large sum, but only slightly in excess of the value of the importations of two classes of goods that are most distinctly luxuries. The Bureau of Commerce and Labor estimates that for the year just passed the importation of diamonds and other precious stones will equal between $40,000,000 and $50,000,000, while the value of the importation of laces and embroideries will equal the same amount; the two together will be close to $90,000,000, and possibly $100,000,000, showing that crude rubber, which has long since become one of the necessaries of life, holds a position of about equal importance, in American consumption, with earrings, brooches and millinery.

STATE OF PARA STATISTICS.

THE annual "Relatorio" submitted to the Governor of Pará by Dr. José Antonio Picanço Diniz, contains a large number of interesting statistical returns, embracing results for the world, for various countries, for the Valley of the Amazon and for the State of Pará.

In a table (reproduced as Table A) of the world's production for seventeen years, there is shown an increase of annual quantity from 34,277 tons in 1893 to 88,000 in 1911, or a gain of about 160 per cent. The rate of increase in Amazonian rubber was from 20,700 tons in the former year to 42,820 in the latter, being at the rate of about 110 per cent.

TABLE A. WORLD'S PRODUCTION OF RUBBER (IN TONS). (PARA GOVERNMENT ESTIMATE.)

YEAR.	Amazonia.	Africa, Central America and Malaysia.	India Plantation).	
1895	20,700	13,577	.....	34,277
1896	21,550	16,175	.....	37,725
1897	22,650	17,240	.....	39,890
1898	21,900	23,359	1	45,260
1899	25,100	24,686	4	49,790
1900	26,750	27,177	4	53,931
1901	30,300	21,547	5	51,852
1902	28,700	23,638	8	52,306
1903	31,100	24,827	21	55,948
1904	30,000	32,080	43	62,123
1905	33,900	35,428	179	69,507
1906	35,250	32,022	646	67,918
1907	37,300	30,171	1,175	68,646
1908	38,850	26,061	2,120	67,031
1909	39,150	26,522	3,700	69,372
1910	38,150	23,747	8,103	70,000
1911	42,820	32,980	12,200	88,000

Consumption is shown in another table to have increased in the aggregate in about the same proportion as production—from 33,952 tons in 1895 to 88,000 in 1911. The latter amount is shown separately for 1911 at 46,000 tons for Europe and 42,000 for America, compared with 16,908 tons and 17,044 tons, respectively, for 1895.

Special interest attaches to the analysis of the 42,820 tons shown as the production for 1911 of Amazonian rubber. This figure is dissected as follows:

TABLE B. PRODUCTION FOR CALENDAR YEAR 1911.

	Tons.
Federal Territory	10,580
State of Amazonas	10,420
State of Pará	10,300
Republic of Bolivia	2,950
Republic of Peru	2,490
State of Matto Grosso	2,100
Republic of Venezuela	50
Republic of Colombia	30
*States of Ceara Bahia Maranhao	3,900
Total	42,820

*Also including Maniçoba, Mangabeira and Soria.

Another table dealing with the year ending June 30, 1912, gives a dissection of the total shipments from different ports to the various destinations. Summarized, it shows following results:

TABLE C. EXPORTS FOR YEAR ENDING JUNE 30.

Shipments from—	1910-11. Tons.	1911-12. Tons.	Shipped to—	1910-11. Tons.	1911-12. Tons.
Pará	14,972	21,577	New York	13,596	20,613
Manaos	16,142	16,664	Liverpool	16,522	15,529
Iquitos	2,372	2,498	Hamburg	777	690
Itaquatiara	108	166	Havre	2,615	3,914
			Antwerp	84	155
Total	33,594	40,905	Vigo	.....	4
			Total	33,594	40,905

This last table, dissecting the shipments to June 30 last, shows that America took 20,613 tons of Amazonian rubber, as compared with 13,596 tons for the last fiscal year. The above figures are those of the Pará authorities. Those of the American Department of Commerce and Labor for the last six years show:

RUBBER IMPORTS FROM BRAZIL (FISCAL YEARS).

	Pounds.
1907	40,286,751
1908	32,645,173
1909	43,993,670
1910	39,510,920
1911	31,020,764
1912	46,762,744

While naturally dealing with the various questions from the point of view of the state of Pará, the important position of that state as a source of supply adds importance to the statistical information given.

AMERICAN RUBBER GOODS IN BRAZIL.

As many people in the rubber trade know, there is to be a notable exposition in Rio de Janeiro next May and June. This exposition will be open—not only to Brazilian exhibitors—but to foreigners as well, and in order to encourage foreign entries the Government will allow all exhibits to enter free of import duty—duties to be paid only where foreign exhibitors sell their products after the exhibition is over.

Probably some American manufacturers will avail themselves of this opportunity to show their product in this progressive part of the world, and those who do not feel like going to the expense of making such exhibits can arrange to have their factory and its products shown to the Brazilians through the medium of moving pictures. Those who visited the recent Rubber Show at the Grand Central Palace, New York, will recall how popular the moving pictures of South American scenes proved to be. They were given four times a day and the auditorium was almost always crowded. Those moving pictures were under the direction of Mr. D. M. Hazlett. He is going to have a moving picture exhibit in connection with the Rio de Janeiro show and intends to devote a considerable part of it to the products of American mills. Any manufacturer who is interested in having his wares displayed in this way can get all the particulars from Mr. Hazlett. His address is 3680 Folsom avenue, St. Louis, Mo.

REDUCTION OF BRAZILIAN EXPORT DUTY ON RUBBER.

As indicated by the summary of the new Brazilian legislation in the June issue (page 427) of THE INDIA RUBBER WORLD, the Federal Government was authorized to negotiate with the states of Pará, Amazonas and Matto Grosso for the gradual reduction of the present duties, until a maximum diminution of 50 per cent. had been effected. It is reported that from January 1, 1913, there will be a reduction of 5 per cent. in the duty on shipments from Pará and Amazonas, in accordance with a recent arrangement between the central government and the two last named states.

RUBBER GOODS EXPORTS TO BRAZIL.

By the courtesy of the Department of Commerce and Labor, advance figures have been received of the rubber goods exports to Brazil for the year ended June 30, 1912.

Comparing the figures with those of 1909 and 1911, the following results are shown:

	1909.	1911.	1912.
Belting, hose and packing	$25,310	$34,442	$40,777
Boots and shoes	23,746	35,548	41,036
Automobile tires	.....	10,112	24,952
All other tires	.....	7,767	11,273
All other manufactures	35,406	62,596	81,203
	$84,462	$150,465	$199,241

An increase of almost 150% within three year is decidedly encouraging.

The Editor's Book Table.

THE TESTING OF MECHANICAL RUBBER GOODS. CIRCULAR No. 38 of the Bureau of Standards. Washington, 1912. [Paper, 38 pages.]

THIS valuable pamphlet combines a number of known facts with interesting details of the system of rubber testing in use at the Bureau of Standards. It is divided into four parts: Introductory (embracing crude rubber, rubber substitutes and reclaimed rubber); manufacture of mechanical rubber goods; physical testing of rubber; and the chemistry of rubber.

Chief interest, from the point of view of the subject treated, attaches to the third section, dealing with the tension, friction, hydraulic pressure and steaming tests most commonly employed. The descriptions are copiously supplemented by illustrations and diagrams.

In dealing with the fourth section, it is remarked that it is only recently that we have known very much of the chemical nature of rubber. The synthesis of rubber, acetone extraction, vulcanization and the determination of the amount of rubber in a vulcanized compound are successively dealt with.

In conclusion, it is stated that the methods of analysis in use at the Bureau of Standards are now in course of thorough testing and revision. It is hoped within a comparatively short time to publish the results of the work.

Reference is made to various standard works and publications dealing with the subject, including the INDIA RUBBER WORLD and the volume on "Crude Rubber and Compounding Ingredients," by H. C. Pearson.

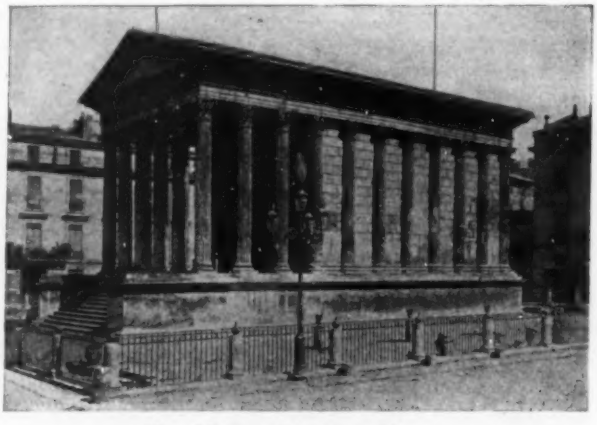
GREEK REFINEMENTS. BY WILLIAM HENRY GOODYEAR, M.A. Yale University Press, New Haven, Connecticut. [Quarto, 227 pp., board covers.]

It is safe to say that all rubber men—at least those in the Eastern section of our country—whose outlook is not bounded by the four walls of their factory or storehouse, who keep abreast with the intellectual life of the age, know—by reputation at least—Professor William Henry Goodyear, the scholarly curator of Fine Arts, at the Brooklyn Institute of Arts and Sciences. But probably there are many rubber men who are

THE THESEUM AT ATHENS.

not aware that Professor Goodyear is the son of Charles Goodyear. The beginnings of the rubber industry in Charles Goodyear's day—though of tremendous prospective importance, were so small in actual commercial production as compared with the vast proportions of the industry today—that Charles Goodyear, in the minds of most rubber men seems like a figure in the distant past; but, as a matter of fact, his death occurred only a half century ago, and his son is not only still living among us, but is adding distinction to the great name he inherited.

Charles Goodyear, though his life was devoted to scientific achievements, was a man of genuinely artistic temperament. That was shown in many of the devices he invented, and the famous exhibitions that he gave abroad, and also to a considerable extent by the excellent drawings that he made of his own inventions. His son has held a distinguished position for over 40 years, in the world of art—particularly in that department of art devoted to architecture. His accomplishments in his chosen



THE MAISON CARREE AT NIMES.

field have been recognized by the leading architectural societies of Europe, and he has been made an honorary member of the Architectural Associations of Rome, Venice, Milan, and Edinburgh, and of the British Society of Architects. He is also the author of many accepted works on the history of architectural art, among them, "Roman and Mediaeval Art," and "Renaissance and Modern Art." The latest contribution from his pen—which is just from the press—is a beautiful volume entitled, "Greek Refinements." It is a book of 227 pages containing a large number of illustrations of ancient Greek temples—some of the illustrations being full page size. Both cuts and text are printed on a heavy paper of fine quality, and the book is bound in buckram covers lettered in gold.

Professor Goodyear first became interested in the Greek refinements (which is another name for various curvatures— perpendicular and horizontal—and other departures from the strictly normal in architecture) over 40 years ago, when in the years 1869 and 1870 he made an exhaustive study of the monuments, the cathedral and other notable architectural objects in Pisa. He wrote an article on this subject entitled "The Lost Art," for "Scribner's Monthly," in the early 70's, but owing to other demands upon his time he made no further literary contributions on this topic for over 20 years—until 1895. Since that time he has devoted a great deal of attention to these peculiarities in the ancient Greek temples, and also in cathedrals and other specimens of mediaeval architecture, and the first result of these years of study and observation of this fascinating phase of early architecture is the book just published which will be followed later, undoubtedly, by a book on the refinements of mediaeval architecture.

This book will be found interesting—not only by professional architects, but by all those to whom art in any of its phases makes an appeal, and also by those who are interested in history —the most absorbing chapters of which were written by the ancient Greeks with their wonderful literature and their unsurpassed and enduring architecture.

THE RUBBER TRADE IN BOSTON.

By a Resident Correspondent.

BUSINESS generally is about the same as was reported last month. The close of the year naturally tends to slow down certain lines, but this is more than made up by increased activity in others. The mechanical branches suffer most at this season, because of the nearly universal custom of purchasing agents to defer buying as far as possible until after the opening of the New Year. Toys, druggists' goods and similar lines are still going with their accustomed regularity, and clothing seems to be as much called-for as ever. Notwithstanding the weather, or perhaps because of it, the tire business flourishes. The one branch which is suffering most is the rubber footwear trade, which is quiet because of absence of snow.

* * *

The Monatiquot Rubber Works Co. is installing a third engine at its plant in South Braintree, Massachusetts—this one of 450 horse power. It is also erecting another brick building, which will accommodate a double line of shafting to work a dozen new mills which will be installed. This company owns a tract of about 12 acres between the Monatiquot River and a branch of the N. Y., N. H. & H. R. R. and also about 25 acres on the gentle slope of a hill the other side of the river. Under the planning of landscape architects this latter tract is to be laid out in streets, all of which will bear appropriate Indian names, Squantum, Samoset, Massassoit, etc. Small lots will be offered at such terms that employes can be enabled to build, and thus form a little community under the finest auspices of health, comfort and rural beauty.

As is the custom of this company at Thanksgiving, turkeys were given to all the married employes both at the factory and at the office. The single men received cigars and the girls boxes of candy. The good feeling between employer and employe at this establishment is noticeable in the *esprit de corps* manifest in all departments.

* * *

The Boston Continuation School has as its pupils a fine lot of young shoe clerks, who are learning much about their business. Last month a practical lesson was given them of how a rubber overshoe was made. Miss Elizabeth A. King, one of the star rubber makers at the Converse Rubber Shoe Co.'s factory at Malden, brought to the school the various parts which go to make a storm overshoe. The manufacture of the sheeting and the cutting and coating of the various pieces was explained, and a rubber shoe made slowly, to show every detail. Then Miss King made another while the students held watches to time the work. The process of vulcanizing and varnishing completed the lesson.

* * *

The Maynard Shoe Co., Claremont, New Hampshire, which has manufactured McKay sewed rubber-soled shoes for some ten or fifteen years, and cemented tennis shoes for a shorter period, has sold all its rubber machinery to the W. C. Coleman Co., of this city, which will probably dismantle the factory where these goods are made. The factory has been sold to the Sullivan Machinery Co., which will utilize it in extending their business. It is reported that the tennis goods end of the Maynard Shoe Co. will be transferred to the Beacon Falls (Connecticut) Rubber Shoe Co., and that the rubber heel business will be discontinued. The Maynard Shoe Co. will, however, continue to manufacture leather shoes for the jobbing trade.

* * *

Work is proceeding right along on the new power plant of the Boston Woven Hose and Rubber Co. at Cambridge. Two units were put in commission on Saturday, December 21, and were found ready for the task set out for them. The whole plant will not be ready before the first of March. The new brass finishing department is now in full running order. Other important improvements are under way, all of which is a proof of the prosperity of the company, and the continued demand for its many branches of product.

* * *

The two buildings on Atlantic Avenue adjoining that in which the Elastic Tip Co. has its office were badly damaged—in fact almost entirely destroyed—by fire early last month, and at one time it seemed certain that the flames would spread to No. 370, but by arduous work this was prevented. Nevertheless the company sustained considerable damage by water, which, however, did not materially interfere with their business.

* * *

The Enterprise Rubber Co. has a prominent store on Federal street in this city, which is passed by thousands every hour of the business day. There are two very large windows of plate glass, and these are not only attractively arranged, but they are filled with most seasonable displays. During the football season the gridiron is reproduced and rubber toy animals are used to personate the players. In the hunting season camp scenes are arranged to advertise clothing, hunting footwear, etc. If the day be rainy the windows, or at least one of them, is sure to contain a display of waterproof coats, etc., while a fall of snow is a practically automatic order for the window dresser to arrange a display of Candee footwear. Undoubtedly this timeliness brings in a large amount of retail trade. At present writing the windows present a true Christmas appearance, and toys of red rubber are prominently displayed in a holly-decorated setting.

* * *

Speaking of window displays reminds me that recently there was on exhibition in the window of the Goodyear Rubber House on Boylston street, a splendid portrait in oil of Charles Goodyear which was painted by Miss Frances Chamberlin, a portrait painter of more than local celebrity. Miss Chamberlin is the niece of Mr. Robert Josselyn, the proprietor of the Goodyear Rubber House which was established thirty-two years ago, and which occupied one store on School street for three decades, moving to Boylston street only about a year ago, owing to the southward march of Boston's retail centre.

* * *

The Eastern Rubber Co., wholesale dealers in rubber clothing and footwear having outgrown their recent quarters, have moved to 72 High street where they now occupy two large floors for stock shipping and offices. They have been working at a disadvantage owing to the increase of their business, as they could not secure additional room at the Purchase street building where their store was, and had to use a floor on Congress street for their surplus stock. The new location enables them to carry on all the details of their business under one roof.

* * *

Richmond L. Chipman's usually pleasant and smiling face is more so than ever just now, as he informs his friends that Richmond L. Chipman, Jr., joined the family December 14, 1912, and is already making a noise in the world. Chipman *père* says that he is going to teach the young scion to chew rubber, so that by the time he is five years old he will be an expert in all varieties of crude gum, and by the time he graduates from college he will be a full-fledged crude rubber man.

While this is the first boy in the Chipman household, he is not the first child. Mr. Chipman has two charming daughters, and he is a most artistic and expert amateur photographer. Recently the kodak people asked for specimens of amateur photographic work. About 18,000 samples were sent and only 1,200 of these

were chosen, and among these was one of Mr. Chipman's photos of his younger daughter. This picture occupies a place of honor in the Kodak exhibition now being shown in the large cities of the United States. Mr. Chipman's picture of his elder daughter was similarly honored in the previous Kodak exhibition.

* * *

The Boston Belting Co. state that their business at Chicago has so outgrown the quarters occupied in that city as to necessitate a removal, and that the new location is at 172 West Randolph street, where with more room and increased facilities the company is much better enabled to serve its customers.

* * *

The well known rubber footwear firm of William F. Mayo & Co., of this city, has changed over into a corporation, named the William F. Mayo Co. This was recently incorporated under the laws of Massachusetts, with a capital stock of $150,000. This in no wise changes the personnel of the concern, the three partners owning all the stock and continuing as before. William F. Mayo is president, and his sons, Geo. H. Mayo and William H. Mayo are respectively secretary and treasurer.

THE RUBBER TRADE IN AKRON.

By a Resident Correspondent.

THE Goodyear Tire and Rubber Co. has invented a rim gauge through L. A. Falor, of the motorcycle tire department, and is supplying the trade on application. With this gauge the dealer can tell in a moment the most suitable-sized tire for any given rim. One simply inserts into the rim the correct gauge length and reads on the proper section of the gauge the exact size to be used. The tire size is printed boldly on the section fitting the rim.

The new offices of the Goodyear Tire and Rubber Co. were formally opened by a banquet December 7. Fully 700 persons attended the banquet and dance in the new office dining room. F. A. Seiberling, president of the company, was toastmaster. After the banquet, a dance followed until midnight. In a short address, Mr. Seiberling thanked his employes for their loyalty in helping to build up the great industry. He called attention to the fact that the office force of the Goodyear company in 1899 consisted of but seven people, while at present it consists of 700.

The company has made it possible for the employes from now on to secure meals at the restaurant of the plant. A souvenir program of the occasion consisting of a booklet, well illustrated, giving an interesting account of the remarkable growth of the Goodyear company was given to each person attending. Mr. Seiberling attributes the success of the company to a great extent to the loyalty and industry of the many, who, in subordinate offices have done their part.

In the combined offices of the new and old plants there are 57,000 feet of floor space. Although at the time the new office building was planned, it was believed to be ample for years to come, yet at present nearly every nook and cranny has been occupied.

The gross amount of business done for the fiscal year now ending was $25,232,207.03. The first year's gross business of the company, summarized under date of September 1, 1899, was $527,080.66.

The first Goodyear office force, back in 1898, upon the organization of the company, consisted of two persons. They were Miss Clara Bingham, still with the Goodyear in a position of trust and responsibility, and Miss Cleveland, now the wife of Dr. Henninger, this city. They came as stenographers. In January, 1899, came W. E. Palmer, now assistant treasurer of the company. Mr. Palmer's duties included those of bookkeeper, timekeeper and bill clerk. Walter Sheill, who later left the company's employ, was collector. C. W. Seiberling, now vice-president, was purchasing agent and sales manager. F. A. Seiberling, now president, was general manager of the company. C. W. Seiberling, and J. A. Burrows, now of Denver, were the sales force. Thus in the first year the entire managerial, office and sales force totaled seven persons. In the factory less than 100 persons were employed at first. There were but two classes of products, bicycle tires and solid carriage tires.

At the recent annual meeting the old board of directors were re-elected, as follows: F. A. Seiberling, Chas. W. Seiberling, H. B. Manton, J. P. Loomis, P. W. Litchfield, G. M. Stadelman and F. H. Adams. Officers were elected as follows: F. A. Seiberling, president; C. W. Seiberling, vice-president; F. H. Adams, treasurer; W. E. Palmer, assistant treasurer; G. M. Stadelman, secretary, and P. W. Litchfield, factory manager.

Frank Seiberling, president of the Goodyear Tire and Rubber Co., has given a contract to construct houses on land which he has purchased in the vicinity of the company's plant. It is the plan at the present time to start the foundations as soon as the weather will permit and have a large number ready for occupancy early in the summer. In the entire lot there will be 500 new homes. These will be sold to employes of the company at cost. It is not the plan of the company to make anything on the proposition but to bring within reach of all its employes homes at reasonable prices. The houses will be modern in all respects, and will add greatly to the appearance of fast growing East Akron.

Count de Almeida of Rio Janeiro, Brazil, representing the Federation of Brazilian Chambers of Commerce, with his son, paid the Akron rubber factories a visit during the first part of December. He was a guest of the Akron Chamber of Commerce and entertained at the Portage Hotel. He says, "Akron is a prosperous city, with big factories and beautiful homes. We often hear of Akron in Brazil, and I was much interested in your great rubber plants." He visited each of the rubber factories and had a conference with each of them relative to Brazilian rubber. He believes that the automobile industry is yet in its infancy and that Brazil will furnish the world with rubber. Count de Almeida is about 50 years old, is a most genial gentleman and is a heavy land owner in Brazil. He speaks several languages, and outside his own language is most at home in French and Spanish. His main purpose in coming to the United States was to study our commercial conditions and to bring closer together the commercial relations between the States and Brazil.

* * *

Clifford B. Myers, former manager of the Diamond Rubber Company's branch at Cleveland, Ohio, has been appointed general manager of the Swinehart Tire & Rubber Co. Mr. Myers was born in Akron and has had quite a number of years' experience in the rubber business.

* * *

Following the general decline of the stocks throughout the country, the stock of the various rubber plants in this city showed a decline of a few points, but within a few days most of them revived to almost their original quotations.

The Marathon Tire and Rubber Co. expects to start its plant and manufacture tires the first of the year.

The B. F. Goodrich Co. has remodeled the immense electric sign which was over the Diamond Rubber Co. buildings and it now reads "The B. F. Goodrich Company, Everything in Rubber."

The Stein Double Clincher Tire and Rubber Co. is being reorganized, details of which are not at present ready for publication.

The Rubber City Machine Co. has increased its capital stock from $10,000 to $30,000. The board of directors is as follows: E. W. Romwebber, Geo. Porter, T. E. Welton, Chas. Henninger, Richard Haag, Chas. Bertsch, and J. H. Romwebber. The officers of the company are as follows: E. W. Romwebber, president; Geo. Porter, vice-president and superintendent; T. E.

Welton, general manager and secretary; and J. H. Romwebber, treasurer.

The Adamson Machine Co. will occupy its new addition shortly after the first of the year.

The Miller Rubber Co. at its annual meeting the latter part of November re-elected the same officers, viz.: Jacob Pfeiffer, president; C. T. Grant, vice-president; F. B. Theiss, treasurer and William Pfeiffer, secretary and assistant treasurer. The board of directors at their meeting December 18, declared the regular quarterly dividend of 2½ per cent. to be paid January 20 on stock of record of January 1, 1913.

THE RUBBER TRADE IN CHICAGO.

(By a Resident Correspondent.)

CHICAGO veterans in all lines of the rubber goods trade learned, long ago, to discount most of the rumors concerning big alleged movements in the way of combinations, new factories, reorganizations, etc. Still, rumors, and rumors of rumors portentious in proportions, continue to be originated and to spread. In fact, in no other lines of business in Chicago do stories of alleged great movements of one kind and another attach to the trade and form the basis of gossip and discussion as they do in the various departments of rubber manufacture and dealings. The prompt denial by President B. G. Work, of the B. F. Goodrich Co., that his concern was about to combine with the United States Rubber, puts a quick end to one of the most interesting rumors of the month.

However, no statement from anybody has caused the rumor that the United States Rubber Co. is to build a new one million dollar plant somewhere in the west to cease to be circulated. It continues to spread among the Chicago rubber men. It is not unlikely that the condition of affairs in connection with this particular movement, is the result largely of the fact that Chicago has no large rubber manufacturing works, and of the hope that, if the story be true, the new million dollar concern will be located here. Against such a supposition, however, the fact is urged that possibilities of labor troubles always exist in greater or less degree in Chicago; and as a result it would be likely that any enterprise of the proportions suggested might seek a location elsewhere.

At the same time it is not an occasion for satisfaction to local rubber dealers or to the people of Chicago generally that the city must draw on places of much smaller size for supplies of mechanical rubber goods. While Chicago is credited with using more automobiles in proportion to population than any other place in the world, the auto makers and owners, must secure their tires from the factories of smaller towns. These conditions have had their influence in increasing the interest in the rumor of the possibility of the erection here of an immense rubber manufacturing plant.

* * *

The month has seen no special changes in the tone of various branches of the rubber business in Chicago. Demands have continued strong and prices are being maintained. General business is showing satisfactory improvement. The hesitancy occasioned by the National political campaign has become a matter of the past. The prospects for 1913 become more and more a certainty. This condition applies to the entire territory covered by the business of the Chicago rubber men. George F. Switzer, who has just returned from a very extensive trip to the Pacific Coast States and the Vancouver section, reports that business in all quarters is in a most satisfactory condition. He calls attention to the prospects based on the arrangements for opening the Panama Canal, and the increased business likely to develop as the result of the San Francisco Exposition. People in the East, he says, do not realize the extent to which the entire country is to be benefited by the Canal opening and the Exposition.

An interesting illustration of the manner and degree in which various large branches of business are correlated, is shown in the late reports of the Allis-Chalmers Company, which turns out so immense an amount of machinery for crushing stones, etc. The stone crushing business, of course, depends to a large degree on certain articles of mechanical rubber for successful working processes. The immense quantity of the stone crushing machinery now being manufactured in response to demands, results in great increase in the business of the Chicago rubber men whose wares are required in connection with such machinery.

Reports of increased business in the lead and zinc mining country and in some portions of the copper mining sections are followed by increased demand for mechanical rubber goods required for mining operations. Great paper mills continue to be running full time and with full crews, and their calls for rubber goods have an influence in increasing the volume of Chicago trade.

* * *

The increased cost of the crude materials used in the manufacture of practically all kinds of rubber goods, particularly cotton duck, is regarded by Chicago experts as sufficient justification for putting up rates on the finished product. It is understood that the officers of the large manufacturing corporations are consultory with their leading representatives in Chicago, with a view to obtaining their opinions concerning the proposed movement. It appears to be expected generally in the trade that arrangements for increased prices will be made early in the coming year.

* * *

Several of the more important Chicago headquarters are arranging for increased facilities for future business, both in the way of enlarged quarters and extension of territory. M. S. Curwen, Chicago manager for the Boston Belting Co., is busy arranging to move into new headquarters, at 172 West Randolph street. Mr. Curwen's present quarters are very extensive, but those into which he will go, as soon as arrangements can be completed, are much larger and will be one of the most attractive places of business in the city. His company has decided, also to take advantage of the increased business on the Pacific Coast, and has secured much larger quarters in San Francisco than those at present occupied.

* * *

While the so-called hard rubber goods in the preparation of which no rubber whatever is used, continue in increasing demand for certain mechanical purposes, the real hard rubber business does not seem to be affected thereby. Local representatives of the leading hard rubber manufactories continue to report excellent business. Probably no other line of rubber goods is affected to so great degree by the demands of the holiday season as those sold by druggists. In this line, the volume of trade is exceptionally large.

* * *

C. W. Lynde, formerly connected with W. D. Allen, Chicago, and later with Pacific Coast Rubber Co. and the Gorham-Revere Rubber Co., has entered the service of the Boston Belting Co., and will have charge of the company's business in Portland, Ore. Mr. Lynde has a remarkably wide acquaintance among the men interested in the rubber goods trade, East and West. His connection with the Pacific Coast Rubber Co. gave him an intimate acquaintance with the conditions of the trade in the section where he is to assume the duties of his new and responsible position.

* * *

When arrangements were made for building the magnificent new station of the Northwestern Railroad Co., on West Madison street, the McIlroy Belting & Hose Co. was one of the concerns forced to move away from that section. The company's works were established in Harvey, with a Chicago office located

at 138 North La Salle street. R. T. Whelply, the Chicago representative of the McIlroy concern, reports that business has increased very largely since the change in location and that the prospects for the coming year are excellent.

* * *

A few years ago, the eelskin seamless, solid woven, cotton belting now so much in demand in this country could be obtained only from England. With the high rate of duties on such material, this sort of belting was very expensive. Now the Boston Belting Co., through its Chicago agency, is furnishing the Middle West, the Northwest and the West with a full line of the materials. Experiments and tests of most severe nature have resulted in agreement on the part of experts that the product of the Boston concern is fully equal to the imported article. This belting is the first of the kind made in the United States.

* * *

An indication of increasing activity on the part of some of the railroad companies is seen in the fact that they are buying more freely in the line of rubber goods than heretofore for some time. The fact that it is necessary to equip many cars idle heretofore, in connection with the movement of the crops, is an explanation of the increasing demand for the output of the mechanical rubber factories for use on cars.

THE RUBBER TRADE IN CINCINNATI.

By a Resident Correspondent.

THE ideal weather that has predominated over the Central States during the past thirty days has been beneficial to the rubber trade in this section. The tire manufacturers report business booming, and indications that there will be no let up in activity, while in the other lines, such as the rubber clothing, golf balls and rubber toys the season has been more active than anticipated.

* * *

Local dealers of adjustable calks and rubber hoof-pads and horseshoes are much interested in the civil anti-trust suit filed by the government in Detroit, December 12, against the Master Horseshoers' National Protective Association and a number of other large manufacturers of horseshoes and calks. Hulbert Marshall, of this city, secretary of the International Union of Journeymen Horseshoers, commented on the action of the government as follows: "The men of our union, numbering 15,000, are employed by the master horseshoers. Why the Association of Master Horseshoers and the manufacturers should be charged with being a horseshoers' trust, I can not understand, for it always seemed to me that they were within the law. I know that the horseshoers did try through agreements with the manufacturers to confine the sale of calks, or toes, and horseshoe pads to horseshoers, but the plan never worked out, and I or anyone else could buy all of these things we wanted. The manufacturers sent out agents who would sell to anybody. A man would buy shoe toes or pads, take them to a shop, and then want his horse shod for fifty cents. Naturally the horseshoers objected and wanted to handle these things themselves, but they never succeeded in confining the sale only to horseshoers."

* * *

To many a poor family Christmas would be of only passing moment, while many poor little tots in Cincinnati would not know the joys of a visit from Santa Claus, if it were not for the activities of W. G. Brown, head of the firm of W. G. Brown & Co., rubber brokers. Mr. Brown has been connected with the Citizens' Santa Claus Committee since its inception, and each year it falls to his lot to be the executive head of that committee. This year a determined effort was made by Mr. Brown and his committee to bring Santa Claus into the lives of 10,000 children. Arrangements were made to distribute Christmas baskets containing dolls, toys, candy, nuts and fruits.

* * *

The Victor Rubber Co., of Springfield, Ohio, filed with the Secretary of State notice of an increase in its capital stock from $60,000 to $150,000.

* * *

The Schaeffer Rubber Co., retail dealers in rubber clothing and rubber sundries, have entered into a lease for a term of eight years, for the storeroom now occupied by them at 116 East Fourth avenue. The lease calls for close to $50,000 as rental for the term.

* * *

J. S. Sackett has placed on the market here a new device, invented by himself, for clamping patches applied to inner tubes. Simplicity is its feature, together with the element of convenience, for the reason that there is no further need of using the foot as a means of pressure while patches are in process of drying. The clamp can easily be packed in any tool chest.

* * *

Not to be outdone by its competitors in this territory, The United States Tire Co. has just completed and is now occupying its own building in Cincinnati. The building is located at 1121 and 1123 Race street, is of re-inforced concrete and terra cotta, three stories in height, and is one of the ornamental structures in the automobile and tire district of the city. The two

NEW U. S. TIRE CO.'S STORE AT CINCINNATI.

upper floors are used as stock rooms, while the first floor is occupied by offices, and is equipped with every modern office environment. From the Cincinnati branch the company covers part of Ohio, Kentucky and Tennessee, having branches under the supervision of the Cincinnati branch in Louisville, Ky., and Dayton, Ohio. R. P. Motte, who for a number of years was connected with Morgan & Wright—before the consolidation—has been selected to head the Cincinnati branch.

* * *

Fred A. Geier, vice-president of the Cincinnati Rubber Mfg. Co., was one of the principal speakers at the banquet following the annual meeting of the Society for the Promotion of Industrial Education, which was held in Philadelphia early in December. Mr. Geier's subject was "What the Manufacturer Can Do to Get Team Play Between the Schoolmaster and the Layman."

* * *

Coughlin & Davis, dealers in auto supplies and rubber accessories, are about to engage in extensive exportations to the nearer points in South America. The firm has been feeling its way to trade relations for some time, and is the first concern in the city, handling such a line, which is going after foreign business.

* * *

The local branch of the Goodyear Tire and Rubber Co. made the best of a record made by one of the Goodyear Non Skid tires, owned by R. Parker Smith, of Fort Wayne. Mr. Smith stated that he has obtained 17,000 miles out of a Goodyear tire and expected to get 20,000.

* * *

The plant and assets of the Ohio Motor Car Company, which was placed in the hands of a receiver on petition of the Diamond Rubber Company several months ago, have been sold to the Northway Motor Co., which has just been incorporated with a capital stock of $600,000 for the purpose of taking over the plant of the former company.

* * *

Local retail dealers in rubber sundries and rubber toys are heralding the movement toward a "safe and sane" Christmas, which has been endorsed by local civic organizations. The movement started is opposed to costly gifts for Christmas, and as presents for children it is urged that toys of an indestructible nature be given as well as harmless. This is a boom for dealers of rubber toys, who for several years have been conducting an advertising campaign to promote the sale of these toys, especially for the smaller children, and it now looks as though their efforts will be rewarded, for dealers report a surprisingly large increase in sales of rubber toys this year over previous years.

THE RUBBER TRADE IN SAN FRANCISCO.

By a Resident Correspondent.

THE status of the rubber industry has not experienced any appreciable change during the past month. All engaged in the business report that the year has been somewhat ahead of the previous one. Indeed the western coast market has grown very considerably and if there were no more houses here than there were ten or twelve years ago, each house would report a substantial increase in business. But the business is now divided between some twenty houses instead of eight or ten. With the increase of business there has been an even greater increase in the number of establishments to take care of it, and this has gradually worked a change in the methods. Even big houses find that they have to look closely to the matter of expenses in order to show a satisfactory profit, and the expense end of the business is more closely attended to now than ever before.

Rents are high in San Francisco and the merchants are insisting that in many cases they are too high. A local rubber merchant found that in Chicago rents in fine sections of the city are no higher than in this city and yet the field there is far greater than here. Outside of the tire industry, which is very active on this coast, the field is limited in comparison with the eastern markets. Of course, owing to the distance between commercial centers, traveling expenses are bound to be higher here and these cannot be very materially reduced, but the feeling is so strong against high rentals that many removals to new locations have resulted, and this is bringing the property owners to realize the fact that it is inadvisable to ask exorbitant prices. As the city has grown following the 1906 fire new buildings have been continually erected, and gradually the rentals in some localities are getting down to a reasonable basis.

* * *

The death of "Tom" Rollins last month comes as a sad bit of news to his many friends in the rubber trade. He has been for several years manager of the branch of the Fisk Rubber Co. located on Golden Gate avenue and was a man held in high esteem and respect by the entire trade.

* * *

W. D. Rigdon, coast manager of the Gorham Revere Rubber Co., with offices on Fremont street; H. S. Sachs, president of the Artgravers Co. of New York; E. H. Farrish, formerly vice-president of the Gorham Rubber Co., and E. S. Vandinwagen and F. C. Cooley, both with the rubber company, have purchased 140 acres of the Fairoaks region, near Sacramento, and each of them will immediately start to improve and develop his portion for country residence purposes. The deal involved $20,000. The Trainor-Desmond Co., which negotiated the sale, has contracted to plant the property to 3,500 trees, leaving space on each tract for bungalows. The varieties of trees to be planted are oranges, lemons, almonds, olives and French prunes. Most of the purchasers intend to build immediately.

* * *

The Goodyear Rubber Co. is rushing work on its new factory on Second and Natoma streets, so that they will be able to move from the temporary quarters which have been found inadequate to the growing demands of the company's business. The new building is of reinforced concrete, two stories in height with basement, and will have a frontage on Natoma street of 145 feet. It is being equipped with every modern facility and within a few weeks the shop will be able to take up its new quarters in one of the finest factories of its kind in the West.

* * *

Arthur Hamlin, who represents the Gorham-Revere Rubber Co. in the Northwest, is now in San Francisco on a flying visit. He looks after the firm's branch stores in Portland, Seattle, Tacoma and Spokane and says that the stores under his supervision are ahead of the business done last year.

* * *

A. H. Gregory, manager of the coast branch of the New York Belting & Packing Co., has returned to this city after visiting the head offices and branches in the East. He finds that his people are very well satisfied with the results for the year and he also notes that most merchants with whom he talked do not apprehend any trouble from the change in political control.

* * *

A. W. Warren, secretary and general manager of the Hodgman Rubber Co. of New York, has been visiting in San Francisco for a few days and will return to New York by way of Portland and Seattle.

Henry D. McCoy, manager of the Chanslor & Lyons Co. of this city, states that his company has secured the agency for the Lee automobile tires made by J. Elwood Lee, and will distribute them through the firm's stores in this city, Los Angeles, Portland, Seattle, Spokane and Fresno. This is the first time that these tires have been represented on the coast.

E. L. Rettig, Pacific Coast manager for the Federal Tire Co., has opened a branch store and shop on Golden Gate avenue.

J. M. Gilbert, general sales manager of the United States Tire Co., accompanied by J. D. Anderson of the corporation, both of New York, have been recent visitors in San Francisco on their tour of inspection of the coast. They report themselves as favorably impressed with conditions here and have decided to increase working facilities and to open new branches.

D. W. McElligott, San Francisco manager for the Halliwell Co., an automobile supply house, has recently taken on a new line, the Jackson-Eno rubber tire specialties

W. D. Newerf, Pacific Coast agent for the Miller tires, has returned from his recent visit to the factory at Akron.

The Panama Rubber Co. has been incorporated at Los Angeles with a capital stock of $1,000,000 by W. H. Newerf, W. E. McCune, A. S. Heilbron, and J. G. Seymour.

The Alcorn Rubber Co. has been incorporated at Los Angeles with capital stock of $20,000. J. A. Alcorn, C. F. Wickland and G. Baker are among the stockholders.

THE RUBBER TRADE IN TRENTON.

By a Resident Correspondent.

AN appalling accident occurred about the middle of December in one of the rubber factories of this city. The details are altogether too shocking to be given, but it might serve a good purpose to give simply the essential facts, to show all rubber manufacturers (together, of course, with other manufacturers) the necessity of guarding elevator shafts so completely that accidents of this sort would be impossible. In this particular mill the company had put a safety gate across the opening in the elevator shaft to keep employes from falling down, but this gate was only about shoulder high, so it was possible for an employe to put his head over and look down the shaft. This is precisely what a 15-year-old boy did at just the moment that the elevator was descending above him. He was struck and beheaded as if by a guillotine.

Fire did damage to the plant of the Empire Rubber Manufacturing Co. last week to the amount of $10,000, fully covered by insurance. The blaze started in the enamel and storage department and the firemen had a hard battle for some hours.

The cause of the fire is unknown, but the opinion was advanced by several employes of the plant that the blaze was due to electricity from the friction of machinery. The fire occurred in the afternoon and the employes fought the blaze pending the arrival of the city fire department apparatus.

The officers of the plant stated that the fire would not in any way hinder the operation of the plant, which is running day and night, as it has been all season.

According to an amended certificate filed in the office of the Secretary of State of New Jersey the General Rubber Co. of Newark has increased its capital stock from five to ten million dollars.

REVISION OF PLANTATION SALARIES.

With lower prices for rubber, the question of the salaries paid by plantation companies for white supervision has been attracting attention. The expenditure of plantation companies may be divided into labor, white supervision and home administration. In dealing with this subject, the "Financial Times" of London lately remarked that the high prices at one time ruling for rubber allowed the payment by producing companies, of high salaries to men with limited tropical experience, and none whatever of rubber cultivation. It is suggested that the plantation companies will find compensation for lower prices not only by increasing outputs, but by a reduction of the current expenses for supervision.

OBITUARY RECORD.

SUDDEN DEATH OF JOSEPH N. SMITH.

MR. JOSEPH N. SMITH, president of the Boston Woven Hose & Rubber Co., died very suddenly at his Beacon street home in Boston, about 11:30 on the evening of December 18. Throughout the day Mr. Smith had been at his office attending to business with nothing to show that he was not in his usual good health except a slight indisposition ascribed by himself and his family to a temporary attack of indigestion. In the evening he attended the opera but complained of feeling worse, and for that reason left before the performance was finished. On returning to his home he retired immediately, dropping into an entirely natural slumber almost at once. About 11:30 Mrs. Smith was awakened by an unusual noise only to find that Mr. Smith had already passed away.

Mr. Smith was born January 12, 1840, in what is now Peabody, but was at that time a part of the town of Danvers. In early business life he was a successful shoe manufacturer, later becoming identified with other large interests, and upon the reorganization of the Boston Woven Hose & Rubber Co., in 1899, was elected a director and president of the corporation. These offices he had held continuously from that time up to his death.

The offices and all departments of the factory were closed Saturday, December 21, as a mark of respect.

THE DEATH OF JOHN H. GREACEN.

John Henry Greacen, at one time an officer of the International Rubber Co., and son of the late John Greacen, died on November 29, on board his private yacht, "The London," at Savannah, Georgia, in his 56th year. The body was forwarded to Glen Ridge, New Jersey, for interment.

UNITED STATES RUBBER CO.'S ISSUES.

TRANSACTIONS on the New York Stock Exchange for four weeks, ending November 23:

COMMON STOCK, $25,000,000.

[The treasury of a subsidiary company holds $1,334,000.]

Last Dividend, October 31, 1912—1%.

Week November 30	Sales	43,705 shares	High	66	Low	57⅜
Week December 7	Sales	39,200 shares	High	67⅞	Low	61¾
Week December 14	Sales	17,050 shares	High	63¾	Low	60¾
Week December 21	Sales	16,450 shares	High	67½	Low	61¾
Week December 28	Sales	8,690 shares	High	65½	Low	61⅜

For the year—High, 67⅞, May 21; Low, 45¼, February 1.
Last year—High, 48½; Low, 30½.

FIRST PREFERRED STOCK, $39,824,400.

Last Dividend, October 31, 1912—2%.

Week November 30	Sales	1,013 shares	High	109¼	Low	108½
Week December 7	Sales	1,245 shares	High	108⅞	Low	106½
Week December 14	Sales	3,400 shares	High	107½	Low	106
Week December 21	Sales	1,850 shares	High	108¼	Low	107
Week December 28	Sales	700 shares	High	107	Low	107

For the year—High, 116, May 20; Low, 105⅝, July 25.
Last year—High, 115½; Low, 104.

SECOND PREFERRED STOCK, $9,965,000.

Last Dividend, October 31, 1912—1½%.

Week November 30	Sales	900 shares	High	80½	Low	80
Week December 7	Sales	300 shares	High	75	Low	75
Week December 14	Sales	600 shares	High	79⅝	Low	78
Week December 21	Sales	2,100 shares	High	80¼	Low	79¼
Week December 28	Sales	300 shares	High	79	Low	79

For the year—High, 85½, May 21; Low, 75, January 23.
Last year—High, 79; Low, 66.

SIX PER CENT. TRUST GOLD BONDS, $18,000,000.

Outstanding of the 1908 issue of $20,000,000.

Week November 30	Sales	7 bonds	High	103⅜	Low	103¼
Week December 7	Sales	25 bonds	High	103⅝	Low	103
Week December 14	Sales	21 bonds	High	103	Low	102½
Week December 21	Sales	26 bonds	High	103	Low	102⅝
Week December 28	Sales	14 bonds	High	103	Low	102½

For the year—High, 105, February 24; Low, 102½, December 28.
Last year—High, 105; Low, 101¾.

The India-Rubber Trade in Great Britain.

By Our Regular Correspondent.

IN the June issue, 1912, of THE INDIA RUBBER WORLD, we reported the action of the North British Rubber Co. v. Willows; this being for the value of dirigible balloon fabric supplied. The fabric proved faulty and useless for its purpose after a few months, and the defendant counterclaimed for damages. At the trial Mr. Justice Scrutton gave judgment in favor of the North British Co., and the defendant appealed. The appeal came on for hearing on November 25, before the Master of the Rolls, and Lord Justices Farwell and Hamilton. The appeal was dismissed; the Master of the Rolls in delivering judgment, laid stress on the scientific evidence and said that Mr. Justice Scrutton was clearly entitled to the view that the duration of life of such an envelope was a matter of speculation and uncertainty.

IN THE COURTS.

Mr. O'Gorman (for the defendant) had given it as his opinion that the life of such fabric was two years, but he had declined to say that it was unfit for use when it left the North British works in October, 1910. It had been suggested that the judge had put the expert evidence on one side, and had relied only on the report of the Advisory Committee on Aeronautics. Mr. O'Gorman, however, had said that they were at a speculative stage on this matter of duration of life, and the judge was not bound to accept the opinion of an expert when such opinion was purely speculative, and not based on the experimental proof which an expert witness should give, if his opinion was to be regarded as final.

With this judgment in existence there is hardly likely to be a similar action, until the experiments which are now in hand both in England and Germany on balloon and aeroplane fabrics, have produced evidence which can be quoted as authoritative. It is important also for expert witnesses to note, that they are expected to back their opinions by experimental evidence.

The case in which Mr. E. E. Buckleton sued Messrs. Heilbut, Symons & Co., for the return of money invested in a rubber plantation was won by Mr. Buckleton at the Liverpool assizes, and also in the Court of Appeal. The defendants, however, took it to the House of Lords; the final result being that they have won and Mr. Buckleton has been deprived of the satisfaction he had previously experienced, and at the same time of course is more out of pocket.

There does not seem any falling off in the demand for reclaimed rubber; the various producing works reporting themselves as fully employed. The largest works (the North Western Co. of Liverpool) has decided, I hear, upon practically doubling their plant in the near future. It is clear from this, that the certain prospect of cheaper raw rubber from the increased plantation output in forthcoming years, does not cause any apprehension as to a serious curtailment of the reclaimers' business. On the contrary, the view appears to be held, that cheaper rubber will result in increased use, and therefore larger stocks of waste to come upon the market.

RUBBER SCRAP NOTES.

The Rubber Regenerating Co., of Trafford Park, Manchester, are again making additions to their works, and have recently purchased further land. The average grade of the reclaimed rubber now produced in England, is higher than was the case ten or twenty years ago, though a demand still continues for 4d. per pound qualities. Indeed there is a market for stuff at 3d. per pound; this lowest quality coming from abroad. The Mersey Reclaiming Co., of Stockport, one of the newer concerns, reports a gratifying increase in their sales and may now be considered firmly established.

The firm of T. Hallas & Co. have removed from their Todmorden works to new premises at Woodley, near Stockport. The factory, which was formerly a wool washing mill, is conveniently situated for carrying on the business; which includes substitute making and heel pads. Mr. Harris, who was formerly with Messrs. G. H. Scott & Co., of New Mills, was the manager at the Todmorden works, but has now left the company.

Scrap rubber collectors complain that the market values of old rubber are now so widely known through the increased circulation of rubber technical literature, that it is a difficult matter to pick up a bargain. In regard to published quotations, sellers of old rubber are too apt to ignore the fact that quotations refer to goods delivered at specified places. When a man has had to travel to a country town on hearing that old rubber is for sale, and finds only four or five tires, he is naturally disinclined to pay the full price quoted for tires delivered in London. The present price for motor tire covers is 38s. per hundredweight, which is about 4s. per hundredweight less than a year ago. Red inner tubes fetch 9d. per pound.

This substance (formerly called Parkesione, after the name of its inventor) will come up for discussion before the Departmental Committee, appointed by the government to enquire into the conditions of manufacture, use and storage of celluloid. Some discussion will probably arise as to the difference, if any, which exists between the various bodies, including celluloid and xylonite, which are all camphor-containing cellulose nitrate plastics. Under the circumstances, a few facts concerning xylonite may be appropriate.

XYLONITE.

At the time in 1868, when Parkes, owing to want of capital, had suspended his manufacture of Parkesine, Daniel Spill, who had been associated with him, effected an improvement, or at any rate an alteration, in the process of manufacture, and patented his cotton xyloidin or xylonite. Further patents were taken out in 1875, after the manufacture had been commenced by Daniel Spill & Co. In 1877 this firm was taken over by a new company, called the British Xylonite Co., of which more anon.

The Spill patents in America were exploited by a Mr. Brown, and a company called the American Xylonite Co. was started in 1881 at Adams, Mass. Litigation, however, arose with the owners of other plastic patents, and in 1890 the company was absorbed by the Celluloid Co., ceasing its separate existence. The works of the British Xylonite Co. are situated at Hale End, near Epping Forest, on the outskirts of London, and also on the Essex coast; the operations being for reasons of safety carried on at the two localities. The buildings at the works are laid out in separate blocks and are of an artistic character; separated by beds of flowers. They are under Government regulation and inspection as if the business formed a branch of the explosives manufacture. The nitrating process, which is the more dangerous part of the manufacture, is carried out at the coast works, the material being made up into combs, tooth brushes, knife handles, etc., etc., at the Hale End Works. From statistics which are immediately available, it appears that Great Britain exported in 1910 celluloid and xylonite goods to the value of £167,000. The imports of celluloid for the same year are given as of the value of £450,000, no mention being made of xylonite.

JOTTINGS.

The Lancashire Motor Transport Co., Ltd., whose prospectus appeared some months ago, and which was destined to revolutionize goods traffic between large Lancashire towns, has come to an untimely end, and is being wound up in bankruptcy. Its career has been unsuccessful.

Mr. Brown, late manager of the Droylsden factory of the Gorton Rubber Co., Ltd., resigned that position in order to take up the management of a new motor tire factory in Australia.

The Werneth Rubber Co., of Gee Cross, Hyde, near Manchester, is making good progress under the management of Mr. Saunders, a former manager of the Gorton Rubber Co. As reported in these notes some time back, these works were put up to auction, as Mr. Salmon, the proprietor, wished to retire from business. As the reserve was not reached, the property was withdrawn, but was subsequently sold privately. The head office is at Burton-on-Trent. Recent developments in the business include railway buffers and small motor tires.

The Synthetic Products Co., Ltd., are at present engaged in negotiating for a site for their works, in which the manufacture of acetone will be carried on. As was stated in the prospectus, the synthetic rubber manufacture will remain a matter for future development. In connection with this I may mention that Professor Perkin is billed to read a paper on synthetic rubber before the Royal Society London, shortly.

GERMAN EXPORTS OF ASBESTOS MANUFACTURES.

ACCORDING to official statistics, the total value of German exports of asbestos manufactures equalled in 1910 $1,060,250, and in 1911, $1,231,500. The latter figure included the following items:

Asbestos paint and colors, etc.	$ 3,250
Asbestos paper and board	453,000
Asbestos yarns and cords	107,500
Asbestos fabrics, etc.	174,500
Asbestos and rubber fabrics	280,500
Insulating materials	212,750
Total	$1,231,500

American exports of asbestos manufactures, which appeared in separate form for the first time, in the annual return to June 30 last, represented $520,894 for the fiscal year 1911-12.

GERMAN RUBBER COMPANIES' DIVIDENDS 1910-1911.

The dividends paid by 18 leading German rubber companies for the business year of 1910-1911 were as follows:

	Per Cent.		Per Cent.
2 companies, between	3 and 4	2 companies, between	9 and 10
2 " "	4 and 5	1 " "	10 and 12
2 " "	5 and 7	1 " "	12 and 15
5 " "	7 and 8	1 " "	20 and 25
1 " "	8 and 9	1 " "	25 and 30

Eight companies worked at a loss. The results obtained by the rubber industry, separately from those of the leather branch, have this year formed a special feature of the returns.

THE EUROPEAN RUBBER INDUSTRY AND THE BALKAN WAR.

While European business in general with the Balkan states has suffered from the consequences of the hostilities, the rubber industry has apparently gained by the complications. Several firms are reputed to have had large orders from the Greek medical authorities. The orders of the Turkish government have included large quantities of hospital supplies and surgical appliances, in which rubber has a prominent part.

"It's an ill wind that blows nobody good."

SILVER JUBILEE OF DIRECTOR HERBST.

Herr Edgar Herbst, of the Austrian-American Rubber Manufacturing Co., Vienna, recently celebrated the twenty-fifth anniversary of his becoming director, with a seat at the board. Born in 1855, he took up laboratory work in 1876 at Carlsruhe, under Professor Engler. He then went to the Von Oehler Chemical Factory at Offenbach. Through the publication by him of a work on the "Chemistry of Rubber," he was invited to Vienna to assume the post which he has now filled during twenty-five years. He is a well-known authority on both the theory and practice of rubber manufacture, having given special attention to the synthesis of rubber. In addition he is known as the editor of the "Rubber Industry Calendar and Annual."

TIRE NOTES FROM FOREIGN LANDS.

Portugal's imports of bicycles increased from $500,000 in 1910 to $650,000 in 1911. During the latter year 208 motorcycles, valued at $24,000, were likewise imported.

A contract for 750 sets of taxi tires has been recently closed by Backdahl & Co., Stockholm, with the United States Tire Co. Experiments had led to the adoption in the Scandinavian countries of American tires, notwithstanding their cost being higher than that of the domestic product.

Herr Wilhelm H. Bartels has resigned the management of the firm of Alfred Teves, Frankfurt, to take up, among other matters, the exclusive sale of the "Garuda" propeller for aerial navigation, motor cars and steam vessels.

Among notable English exhibits at the recent London show were those of the Connolly and Avon tires. The former concern was associated from the start with the development of the rubber tire, to which their experience as wheel manufacturers also contributed, particularly in devising the most durable and non-skidding patterns.

The Avon India Rubber Co., Ltd., has brought out a special tire with an extra thickness of rubber on the surface of the tread.

Among the features of the recent London show, were the pneumatic and solid tires of the Midland Rubber Co., Ltd., of Birmingham. They made a special display of their "Ajax" pneumatic tire, which carries with it a 3,000 mile minimum guarantee. Solid rubber tires of this company's make carrying a 10,000 mile guarantee have been supplied to the London General Omnibus Co. and the National Steam Car Co., besides other public motor enterprises.

NEW RUBBER WORKS IN IRELAND AND SCOTLAND.

According to English reports, a company is being formed called the "Irish Rubber Co." to manufacture tires and other rubber goods in Ireland. The influence of local directors is being exercised to bring the factory to Dublin, but Wexford has also been under consideration. The promoters are said to have obtained the support of 500 cycle agents in Ireland.

It is reported that a large Scottish rubber manufacturing firm is about to establish at Newburgh, Scotland, a factory for ladies' waterproof garments.

CALMON AUSTRIAN WORKS INCORPORATED.

The Calmon Asbestos and Rubber Works of Hirschstetten, Austria, have been converted into a limited company; the business managers being Imperial Councillor Hugo Goldschmidt and Herr Marcel Herczeg, of Vienna. It is announced that the capital of the company is the equivalent of $422,046.

NOTHING NEW AT PARIS AERONAUTIC SHOW.

At the recent Aeronautic Salon held in Paris there appeared to to be nothing particularly new in the line of rubber manufacture. There was a good display of pneumatic tires, shock absorbers and rubberized fabrics, but practically nothing that was not shown at the exhibition a year ago.

JAPANESE RUBBER PLANTATIONS IN MALAY PENINSULA AND SUMATRA.

By Our Regular Correspondent.

REFERRING to particulars lately sent of Japanese rubber growing in the Malay Peninsula (published in the INDIA RUBBER WORLD of December, p. 155), the total acreages rented and cultivated by 87 plantations have since increased respectively, to 85,069 and 16,455 acres.

STATE OF JOHORE.

Out of the above-named 85,069 acres, Johore has 79,010; divided as follows:

Along the River Johore in eastern part of state.....	45,860
West coast	30,870
Along railway	1,300
Other locations	980
Total	79,010

As previous report showed, Johore has in number one-half of the Japanese plantations on the peninsula and is encouraging

MALAYAN WORKERS CLEARING WEEDS UNDER DIRECTION OF JAPANESE MANAGER.

rubber planting. The government is facilitating planting operations by allowing planters time for payment of ground rent and survey fees. The ground rent, moreover, is lower than in other Malay states. Leases are for ever, while in other states they run for 99 years and in Dutch India for 75 years. Owing to the competition for riverside plantations, many of the Japanese plantations are inland. Most of the latter are still in the preparatory stages of wood-cutting and weeding, but some have been cultivating Pará trees for several years, and are in a few cases tapping.

STATE OF NEGRI SEMBILAN.

The total acreage rented in this state by Japanese rubber plantations is now 3,010, as compared with 2,845 by last report. Near Seremban, the capital, many of them are being gradually developed. One plantation of 160 acres, with 8 and 9-year-old Pará trees, has been acquired for $300,000 by an English firm which intends cultivating it in conjunction with Japanese planters. On four-fifths of the acreage wood-cutting and the removal of weeds are being carried on.

STATE OF SELANGOR.

Latest particulars show the area of Japanese plantations as 1292 acres, mostly cultivated and reaching maturity; thus showing a reduction on the average of 1420 previously reported. Owing to the competition of British investors, Japanese capitalists are at a disadvantage; so they are seeking locations along the railways to the south; thus avoiding Kuala Lumpur, the center of the British plantations.

KEDAH, PERAK AND SINGAPORE.

A Japanese residing at Penang has a plantation of 450 acres in Kedah. Many Japanese investigated, but did not start operations.

Three plantations in the State of Perak have 1,055 acres in all, while three Singapore planters have 250 acres between them.

ANTICIPATED YIELD FROM JAPANESE PLANTATIONS.

The total Japanese acreage is 85,069, which is estimated as about 9 per cent. of the total Malayan acreage. When these plantations come to tap Pará rubber later, their yield will be an appreciable factor in the market. At the rate of 130 trees to the acre, the 85,069 acres, on the basis of 1¼ pounds per tree per year, would represent a yield of 16,588,455 pounds.

Two-thirds of these planters are small investors, to whom planting is an additional occupation, and who cannot get along without making profits for several years. They hope to get funds from the "Mujinko," a lottery association (described by the INDIA RUBBER WORLD, April, 1912, page 339). If they cannot cultivate their own plantations, these small investors will sell out to other planters or amalgamate with them.

SUMATRA.

In 1911, the total investment in Japanese rubber plantations in Sumatra was estimated at about $400,000 and the plantation area 140,000 acres. Among these plantations is one of two acres planted with rubber trees and cocoanut palms, owned by a German who had married a rich Japanese woman. The latter had engaged about 60 Japanese workers, 16 of whom are still employed, and who superintend the labor of Malayan and Japanese hands.

Owing to their unfitness for tropical life, and their inability to stand heat, Japanese usually fall ill soon after their arrival in Sumatra. Though not fitted to act as workers, there is ample room for their services in directing Malayan and Javanese laborers, or in tapping, gathering, and coagulating.

JAPANESE RUBBER PLANTERS' ASSOCIATION.

This association was established on August 15, 1912, at the Sekidenkwan Hotel, Singapore. It has 38 members, mostly large Japanese planters located along the River Johore; their purpose being mutual protection and development.

It is proposed to issue a monthly bulletin and to hold organized consultations with members as to rubber plantations.

Following is the list of the officials: President, Sinzo Suzuki; vice-president, Masaji Inoue; committee, O. Watanabe; S. Kawakami; M. Yoshida; K. Yamakawa; Y. Goto, and M. Sasaki.

Headquarters of the company are at the above-named hotel, the name of which means "Japanese Hotel."

JAPANESE LABORERS FOR MALAYA.

The efforts made by private enterprise to employ Japanese labor in rubber plantations at the south of the Malay Peninsula are being followed up by organized steps in other directions. According to the "Japan Mail," the "Toyo Imin Kaisha" (Oriental Emigration Company) recently obtained permission to send Japanese laborers to Malaya, and a party of 150 men was shortly to leave Japan.

In view of the hygienic situation in Johore being unsatisfactory, attention has been given to the question of better conditions in other parts of the Peninsula. These have been found to exist in the northern portion of Perak, and a contract has been made with an English plantation owner for the despatch of a small number of Japanese on probation to that district.

Under the conditions of employment, the Japanese undertake nine hours' daily labor for the equivalent of 40 to 45 cents gold.

Getting Balata by Destroying the Trees.

IN a recent issue of THE INDIA RUBBER WORLD our British Guiana correspondent stated that a proposal recently ventilated, that instead of balata trees being partially bled and kept alive for future bleedings, they should be cut down entirely and every ounce of balata extracted, occasioned much surprise in the colony. He went on to say that on calmer consideration, however, many people were beginning to think that there was a good deal in the suggestion and he quotes a prominent member of the British Guiana Balata Association as follows:

"It is understood that the balata tree on being cut down yields 30 lbs. to 40 lbs. of milk, whereas under the present system the quantity obtained by a good bleeder is only some 5 lbs. By periodical bleeding, therefore, it would take 30 years to get a result obtainable immediately by cutting down the tree, and I venture to say that there is hardly anyone in the colony who will contradict the statement that at the end of 30 years the trees will be dead. The cost of periodical bleedings must necessarily be very much greater than the cost of cutting down trees, and, the question comes to be whether is it better to bleed entirely a tree at once or allow it to remain till it dies within a period of 30 years?"

TAPPING BALATA, BRITISH GUIANA.

As a matter of fact, this proposal is not of recent origin. The process of extracting the latex from the balata tree by the destruction of the tree and the removal of all the bark was given a thorough test some 15 years ago and the results, according to those who made the experiment, were very highly satisfactory. Three Americans went into this enterprise in Venezuela in 1896. They put up a plant at a cost of about $25,000, with an average production of over 500 pounds of gum per day. They reported that the average balata tree in Venezuela furnished 1230 pounds of bark, that it required 30 trees to produce one ton of gum, the average extraction being about 66 pounds of gum for each tree. This, however, was from trees which had been previously tapped and from which 10 to 16 pounds of gum had already been taken, their estimate being that from trees that never had been tapped, from 80 to 120 pounds of gum could be secured, while by the tapping method not more than 8 to 16 pounds of gum could be secured. (It is quite likely that these figures are more than tinged with a promoter's natural optimism.)

They claimed a number of distinct advantages for this process. The first was the large amount of gum that could be secured at one time, as compared with periodical bleeding. Another advantage was the fact that the work could go on regardless of the season, which would not be true under the ordinary process of bleeding. The third

was that the gum was much more pure and free from sand and dust and bark. They reported that it cost them to produce the gum less than 8 cents a pound.

Through some dissension in the management the enterprise seems to have been abandoned and not since resumed, but the success, or at least the reputed success, of this early undertaking would at least seem to afford considerable encouragement for further experimentation in this direction.

NOTES FROM BRITISH GUIANA.

From our Regular Correspondent.

THE report on the forests of the easily accessible portions of the colony, by C. Wilgress Anderson, Forestry Officer, is now being published. The general report and Series 1 have been issued, and others are to follow in due course. It cannot be said that the general report offers quite that amount of assistance upon matters connected with the balata industry, that have long been calling for settlement, that was expected. Mr. Anderson opens that section of his report dealing with the balata resources of the colony, by pointing out that "the collecting of balata has within the last four years been most extensively carried on, so much so as to have now become the foremost forest industry, but judged by the value of the exports, the third most important one of the colony."

Mr. Anderson does not appear to have any original information to give us respecting the yield of the tree, but points out the well known fact that the flow of latex is best in the dry seasons, and that "in very dry seasons many of the trees do not flow at all." He proceeds to quote Jenman, to whom we owe the great amount of our existing knowledge of the bullet tree, and whose advice, if followed, would have enabled us to have a promising rubber industry at the present time, instead of the one of meagre proportions we now boast of. Mr. John Ogilvie's estimates for the Rupununi District are also quoted, and Mr. Anderson says that these estimates "are in close accord with respect to the average yield, which works out at four lbs. of balata per tree on the first occasion of tapping. This I consider may be accepted as a reliable estimate, for apart from being based on data obtained by highly observant and experienced individuals, I am well aware that collectors are generally quite content if they get as much as a gallon of milk for an average good-sized tree, tapped in the usual way for the first time. On subsequent tappings the yields are said to be less." This is not an important contribution to the available knowledge on the subject.

Mr. Anderson discusses also the question of felling the trees, which was alluded to in a recent letter, but here again he adds nothing new that will lead to a settlement of the question. For the most part his figures are quoted from previous authorities, which have already been referred to by those taking part in the controversy. Jenman said, and his remarks are quoted by Mr. Anderson, that "a young tree, a foot in diameter, felled, will give a gallon. A gallon of balata milk weighs over 10 lbs., collectors say 10½ lbs. Two samples I collected weighed 10.033 lbs. During the rainy season collectors estimate the yield per gallon at from 4 to 5 lbs. of pure balata and in the closing parts of the year 5 to 6 lbs. Average balata milk loses less than half its weight in drying."

Mr. Anderson points out that in Venezuela the felling method of collecting the milk is invariably practised, but that "this method, although at first used in British Guiana, is now against the law, as it also is in Dutch Guiana." He tells us that the felling method involves a comparatively small extra amount of labor, "and that the returns immediately obtained are far in excess of those obtained by the method of tapping the trees while standing," but he does not tell us how much they are in excess. He tells us, however, that "the felling method is undoubtedly a most wasteful one, as the forests are denuded of valuable trees," but again he gives us no figures, going on to say: "Unfortunately there are no reliable data available as to the yields obtained on the successive tappings made after the tree has first been bled, the class of men employed as bleeders and the conditions under which the work is being carried on being such as to render it difficult, if not impracticable to obtain such data. Yet the indisputable fact remains that the tracts of Crown lands on which the balata trees were first tapped a quarter of a century ago are still being worked and continue to yield supplies of balata. That this is the case I can testify from personal experience, for balata is still being obtained from certain tracts on Canje creek surveyed by me in February, 1889, on which most of the trees had at that date been already tapped." These remarks cannot be said to help on the controversy one way or the other as to the desirability of allowing licensees to fell trees.

The report is equally lacking in original information in respect to the age and growth of the trees, which bear an intimate relationship to the felling problem. Mr. Anderson informs us that the bullet tree is considered to be of very slow growth, but so far little is known with regard to the time it takes for a tree to grow sufficiently large to be fit for tapping, much less how long it takes to reach maturity. He informs us, however, that a balata tree planted in the Botanical Gardens in Georgetown, in 1880, has a trunk 48 inches in girth and branching 8 feet from the ground, being over all about 50 feet in height. He proceeds: "It has been reported by an officer of this department that on certain properties on the Canje creek, bullet trees of not more than ten inches in girth are to be found growing on beds originally laid out and cultivated by the Dutch, which probably have been abandoned for at least 80 years and are now recovered with forest growth. The trees in this case are said to be growing tall and straight. Further investigation on these lands may help to throw some more light on this subject."

Inasmuch as Mr. Anderson has been engaged since 1908 getting data for this report, and the Acting Governor has told us that it will be the standard authority upon Colony timbers for 25 years, it may be regarded as disappointing to be told that further investigation is needed to throw further light upon the subject of the balata resources of the colony when it is most needed. In fairness to Mr. Anderson, however, it has to be admitted that he is engaged in a herculean task. It is quite impossible for one Forestry Officer to investigate the resources of a forest area of 83,000 acres and supply us with any important data. What is needed is a thoroughly well equipped Forestry Department, and the creation of such a branch of government activity would appear to be well justified by the growth of the balata and other forestry resources. It will be recollected that the government's proposal to tax forest industries by means of the export duty was justified on the ground of its growing demands upon the revenue, and that this view was confuted by the Balata Committee, which pointed out that the industry's contributions to the revenue were greatly in excess of the amount spent upon it. The creation of a Forestry Department, it would appear, ought to be one of the first acts of the constructive Administration that is just opening.

Mr. Anderson enters into considerable detail concerning tapping regulations and tapping methods, but they are probably familiar to readers of the INDIA RUBBER WORLD. The balata wood is described in the report "as a well-known marketable one of considerable value. It is a very hard, heavy, dense wood of a moderately fine grain, and varying in color from a reddish tinge to a dark red. Because of its color it was a few years ago put on the English market under the name of 'beefwood.' The weight per cubic foot is 55 to 68 lbs.; the largest logs being 80 feet long, and squaring over 40 inches." The restriction as to the felling of the trees, however, prohibits its exportation as timber. Mr. Anderson points out that there are many large logs lying waste, particularly in the forests of the North Western District,

where many trees were illegally felled as recently as a few years ago, but the difficulties of transportation prohibit its exportation. It will be remembered that one of the claims of those who wish to have the restriction as to felling removed, is that after the balata has been extracted a marketable wood remains. Mr. Anderson's information appears to throw some doubt upon this claim. It will not be sustained until means of transportation are improved.

Mr. Anderson's report is more informative when he comes to discuss the distribution of trees. He says that they are to be found growing in most parts of the colony, being widely dispersed throughout the forests of the savannah lands, but on the slightly elevated lands and hilly country they usually occur in communities, varying in number from a few to thirty or more trees, which are irregularly distributed within definite forest areas, or in belts of varying extent, known locally as "bullet tree reefs," in which these communities occur more or less concentrated. "Hence the trees are more plentiful in the depths of the forests than near the rivers. During my inspections, and on the many previous occasions on which I have traversed the balata forests, I have never found any land which the bullet trees occupy to the entire exclusion of all others, but I have come on particular forest areas or zones in which this tree was among the most prevailing species of forest trees." The distribution, says Mr. Anderson, is "not a question of soil, but may be due to situation with regard to access of light; but evidence so far collected is not sufficiently convincing on this point of the problem." He proceeds to the local distribution of balata trees in the easily accessible forests. In subsequent reports doubtless the result of his researches will be more fully amplified.

Mr. Anderson also supplies some interesting information concerning the *Sapium* rubber tree, for details of which he refers us to the Imperial Institute's "Bulletin" and the Department of Science and Agriculture's "Rubber and Balata in British Guiana." He says these trees are to be found scattered about the forests of the colony generally, but more particularly in those bordering the banks of the rivers or streams of the North West District, the Pomeroon, and the lower Essequibo rivers. "Estimates made in certain localities in the upper Amakura-Barima District, where these trees are reported to grow most plentifully, indicate that in certain localities they only number about 30 to the square mile." Mr. Anderson reports that the tree reaches at maturity an average girth of 60 inches and a height of about 60 feet, but that they occasionally attain much greater dimensions. The trees occur mostly in the western part of the colony, on the upper Amakura River, Barima River from Morawhanna upwards and its tributaries, the Barama and the Waini rivers, the upper Pomeroon and the lower Essequibo River, but that in the forests on the Demerara, Berbice, Canje, and Corentyne rivers they are either very scarce or not found at all.

Mr. Anderson says that there is reason to believe that at present the name *Sapium Jenmani* is applied generally to rubber-producing *Sapiums* and other *Sapiums*, such as *Sapium Hemsleyanum, Huber*, growing on the coast lands or in the forests and also known by the name of "Mabua," yielding a latex of a more or less sticky nature, and of no value. The Hya-hya, two species, also yield a copious flow of latex, which when dry forms a hard substance. Mr. Anderson says that the milk of this tree has been stated to be drinkable, but he does not recommend it. The latex of these trees, also the balata (bully) tree, *Sapotacae ficus*, is of no commercial value.

It will be remembered that among the proposals of the Balata Committee was the improvement of means of communication by means of wireless telegraphy. The Chamber of Commerce has now received proposals from the Anglo-French Wireless Company, Limited, which it has sent on to the Government, offering to erect and install seven stations at Georgetown, Zisingaatugalso Pass (on the Brazilian Boundary), Morawhanna, Bartica, Wismar, Omai (for the Potaro District), and Arnida Post (for the Rupununi District), at a cost between $10,000 and $15,000 erected. This estimate coincides with the estimate made a year ago by John Alsing, assistant government electrician. The Council of the Chamber of Commerce hopes that the scheme may have the favorable consideration of the Government.

Mr. Edward Edwards, local attorney for Ed. Maurer & Co., New York has been appointed to act as attorney of the Amsterdam Balata Co.

The exports of Balata to November 7, were 460,648 lbs., as compared with 833,022 lbs. to November 7, 1911.

THE AMERICAN-MEXICAN RUBBER AND COFFEE CO.

We published the notice in our December number of the incorporation in New York State of the American-Mexican Rubber & Coffee Corporation with its principal office at Ithaca. A request sent the secretary of the company for some information regarding its operations elicits the following interesting paragraphs:

"The corporation owns about 17,000 acres of valuable land about 30 miles north of Tapachula, State of Chiapas, Mexico, and near the Huixtla Station. We have about 2,800 acres of land in coffee consisting of 1,000,000 trees, ages from one to fourteen years—about 1,400 acres in bearing from which was sold last year over 1,100,000 lbs. of coffee. We also have about 2,500 acres in rubber containing over 950,000 trees, averaging from one to seven years. We expect to begin tapping next year, although a few of the trees are old enough to tap this fall.

"We own our own electric light plant which furnishes light and power for the plantation; also our own telephone system with over thirty miles of telephone wire connecting the different sections. The Pan-American Railway crosses the property affording prompt shipments. The majority of the directors and stockholders of this corporation are also interested in the Mexican Coffee Co., which is incorporated under the laws of New York State, for $100,000 owning 3,000 acres adjoining the property of our new corporation, and which has paid 10 per cent. dividends since its incorporation."

ENGLISH AUTOMOBILE IMPORTS AND EXPORTS.

For the nine months ending September 30, 1912, English imports of motor cars and parts equaled $27,263,425, against $22,825,965 for the corresponding period of 1911. Exports for the same periods represented $12,662,685, as compared with $10,633,010 in 1911. Development is thus shown in both directions; England importing to double the extent of the automobile exports.

These figures referring to automobiles in general, and thus including the high priced French machines, it is of interest to note the statement in the "Carriage Monthly," that the English imports of American automobiles during the first half of last year, represented 3,327 cars of the average value of about $1,000. It is added that:

"The low-priced American car has made the automobile a possibility for a large number of Englishmen, who could not have afforded to pay the price of the higher priced English cars, and has taught the British public to appreciate a vehicle that is reliable and economical in operation, even though some of the refinements to which they had become accustomed may be wanting."

British makers having specialized in cars at $2,000 and upwards, there is said to be at present apparently little prospect of American cars of that type obtaining a substantial footing in the English market.

THE NEW SUPERINTENDENT OF SINGAPORE BOTANIC GARDENS.

It is announced that Mr. J. H. Buckill, hitherto attached to the Indian Botanical Service, has been appointed by the British Colonial Secretary to replace Mr. H. M. Ridley as superintendent of the Singapore Botanic Gardens.

Some Rubber Planting Notes.

STATISTICS OF LEADING PLANTATION COMPANIES.

FIGURES of leading plantation companies for the entire year 1911 as compared with the first nine months of 1912 show following results:

	Year 1911. lbs.	9 months, 1912. lbs.
Highlands & Lowlands Pará Rubber Co..	633,024	618,180
Anglo-Malay Rubber Co.....	780,972	608,090
Linggi Plantations 1,064,500		776,000
London Asiatic Rubber & Produce Co..	352,688	472,400
Grand Central (Ceylon).....	406,061	389,960
Damansara (Selangor) Rubber Co.....	383,745	385,340
Lanadron Rubber Estates.....	375,846	392,990
Kapar Pará Rubber Co.....	330,861	369,360
Seafield Rubber Co.....	308,461	332,650
Sungei-Kapar Rubber Co.....	338,480	325,200
Gula Kalumping Rubber Estates.....	243,040	315,900
Pataling Rubber Estates Syndicate....	333,044	315,480
Consolidated Malay Rubber Estates...	401,897	314,810
Seremban Rubber Estate.....	363,344	305,810
Batu Caves Rubber Co.....	261,605	261,200
Total for year 1911.....6,577,568		
Total for 9 months, 1912.....		6,183,370

Thus the output of 15 leading companies reported for the first nine months of 1912 was nearly as large as it had been for the entire year 1911.

LATEST CROP REPORTS.

The cabled reports of the larger companies to November 30 show a continued increase as compared with last year. Thus the Anglo-Malay reports 813,649 pounds as compared with 692,786; while the London Asiatic does still better with 624,581 pounds against 301,039. Selaba records 288,928 pounds as compared with 176,043. The gain in the output of the smaller companies is in some cases in even a higher proportion.

TANDJONG RUBBER CO., SUMATRA.

The crop for the year ending June 30, 1912, of the Tandjong Rubber Co. was 34,864 pounds, exceeding the estimate by 4,864 pounds; the average yield being 108 pounds per acre. The net average price realized was 4s. 4.46d. per pound, against f. o. b. cost of 3s. 2.18d. per pound. The relatively high cost is owing to the recruiting of additional coolies, and the expenditures caused by inaugurating tapping. By the fact that the estimate for 1912-13 is 180,000 pounds, and the estimated cost reduced to 2s. 3d. per pound, the prospect of a large number of trees being about to come into bearing is indicated.

LANGEN (JAVA) RUBBER ESTATES.

According to the report presented to the annual general meeting of December 3, the original estimate for the year ending September 30 was 42,000 pounds; afterwards raised to 92,500 pounds. The amount actually harvested during that period was 145,633 pounds, the cost being 2*s.* 3.86*d.* per pound and the average net price realized 3*s.* 11½*d.* The estimate for the current year is 250,000 pounds; a reduction in cost being anticipated.

UNITED MALAYSIAN RUBBER COMPANY, LIMITED.

Prominence is given by the "Malay Mail" to a statement made to the shareholders by the secretary of the United Malaysian Rubber Co., to the effect that good progress is being made, reports of which would be published in due time.

UNITED SERDANG (SUMATRA) RUBBER PLANTATIONS.

In the report presented to the shareholders at the annual meeting of December 1, of the above company, the crop secured up to the date of the accounts was shown as 534,979 pounds, against a quantity of 218,000 in the previous year. The estimate for the year (ending August 31) had been 433,000 pounds. For the current year the estimate is 921,000 pounds.

A satisfactory feature recorded, was that the growth of the rubber is excellent, as well as the renewal of the bark, these conditions being attributed to the system of wide planting carried on throughout the estate. This system has promoted the renewal of the bark, which, it is added, is the capital of the rubber tree.

TANGKAH RUBBER ESTATE (JOHORE).

According to the report for the year ended September 30, 1912, presented to the shareholders' meeting of December 16, the crop of rubber amounted to 54,000 pounds against an estimate of 40,000 pounds, and a quantity for 1911 of 17,413 pounds. The estimate for the year ending September, 1913, is 100,000 pounds.

In order to develop the estate, the installation for an up to date factory has been shipped; while orders have been placed for a suction gas engine and the necessary washing mills. The cultivated area is 1,600 acres.

BOTANICAL GARDEN FOR SUMATRA.

According to the Batavia "Niewsblad," the local Director of Agriculture has gone to Medan, Sumatra, with the object of finding a suitable location for a Botanical Garden. Many of the larger planting companies are said to be interested in the project and have offered their land to the government to help the work. The general opinion in Sumatra is that such an institution would materially help experimental planting work and would afford much information as to the most suitable methods of cultivation.

KAMERUN AND CONGO RUBBER.

From the results of a botanical investigation undertaken by Herr C. Ledermann by order of the German Geographical Commission, it would seem that Kamerun is much behind the Congo in the preparation of rubber by the natives. In the latter territory every factory has a drying house, while Mr. Ledermann could not discover a single one in Kamerun.

He considers the higher value of Congo rubber, particularly Kassai, as being due to its judicious treatment by the Belgian buyers, who cut it, remove impurities as far as possible by beating and kneading, and reject every piece of crude rubber found to be adulterated.

It is added that if similar care were exercised in Kamerun, rubber from that quarter would command a higher price. Kamerun trees yield a good product, and the natives are not unskilled as rubber collectors. They must, however, be trained to deliver only rubber of good quality.

RUBBER IN FRENCH WEST AFRICA.

President Falliéres has recently approved an ordinance for the regulation of crude rubber gathering in the French West African territories. The Governor-General of West Africa had urged upon the government the need of such a measure, in order to prevent the depreciation of the article on the European markets.

According to this ordinance, the preparation and sale of crude rubber is forbidden in other form than in slabs or cakes of the maximum thickness of one centimeter (two-fifths of an inch); in crepe, or in very thin strips. Gathering from rubber plants is prohibited every year during a period not exceeding three months, to be fixed by the Lieutenant-Governor of each Colony. During this time, business in rubber can only be carried on in French West Africa with a certificate that the rubber was gathered before the commencement of the close season.

New Rubber Goods in the Market.

NEW GOODRICH SAFETY TREAD TIRE.

RAISED tread formation in any style does not of itself constitute a non-skid tire. It is the arrangement of it which offers resistance to any slipping or skidding movement. In the case of the traction engine, the cross-bars or strips attached to the rim of the wheel bite into the road, giving the necessary hold against slipping, thus allowing the bulky engine to be propelled up and down hill, and over all kinds of roadway.

The application of this principle to the tread of an automobile tire has been engaging the attention of the B. F. Goodrich Co., and the apparent difficulty in the matter has been overcome by means of a series of longitudinal bars, broken into cross sections and strengthened by the cross-bars. In this way there is in reality a double series of raised projections, with the cross-bars holding against forward slipping and the longitudinal bars gripping the pavement and lessening the possibility of side slipping.

The double set of bars is distributed so as to prevent any punching in at any point on the fabric construction. In this way the cross-bar principle of traction wheels is adapted to automobile tire tread construction, being modified to meet rubber tire conditions. [B. F. Goodrich Co., Akron, Ohio.]

"STEEREASE."

For the prevention of slipping through the hands, it has been customary to wrap motor steering wheels with twine, rope, tap etc. Apart from the fact that such a wrapping is apt to chafe the hands, its efficacy for the purpose intended has been questioned.

With the object of meeting this difficulty a new device, "Steerease," has been introduced. This is manufactured from a fine quality of rubber, specially molded, and constructed to fit the steering wheel of the various motor cars and trucks. Being slightly corrugated, it prevents any slipping of the hands in wet weather, while there is no bunching, caused by the slipping of the cover upon the wheel.

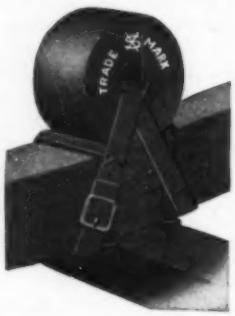
"Steerease" is easily applied. After thorough cleaning and the consequent removal of all moisture and grease, it is stretched over the wheel, the edges being made to fit closely together. These are turned back and the cement applied; being allowed to spread as much as possible. The wheel is firmly wrapped with tape and allowed to stand overnight, being then unwrapped. [Goodyear Rubber Hose and Packing Co., Philadelphia.]

RUBBER GLOVES FOR SURGEONS.

At a recent German medical congress, Dr. Krömer, of Greifswald, gave particulars, illustrating that specially prepared rubber gloves afforded greater antiseptic protection than any other description. The importance of these preventives in cases where the coating of the stomach of the patient had been injured was particularly dealt with.

THE ESSEX BUMPERS.

Among the prominent features of the Essex Rubber Co.'s line of automobile accessories are their very elastic and pliable rubber spring bumpers. These are made from high-grade stock, and retain their elasticity without becoming hard from old age. With the object of conforming to different kinds of springs, they are made in various shapes and sizes; the oblong being in three sizes, from 6½ to 8¼ inches in length, 1⅜ to 1¾ in. width, and 3 to 4 in height. The round bumpers (illustrated herewith) are likewise made in three sizes from 1½ to 2 inches in width, and from 3¼ to 3¾ in. diameter. One special advantage of the Essex Bumpers is that they will at certain times prevent the springs from breaking, when subjected to a sudden jolt.



Seeing the important functions of the spring buffer, the value of its reliability is self evident. This consideration is specially met by the Essex Rubber Co's products of this class, which are the results of close study of existing requirements.

The "Essex Outside Hook-on Boot" is also proving very popular among many users of automobiles. It is made of fine duck and high grade rubber. [Essex Rubber Co., Inc., Trenton, New Jersey.]

ANDERSON NEVERSLIP CUSHION HEEL.

The Anderson Patent Neverslip double cushion heel is said to be a triumph in rubber heel manufacture. Among its other features, claim is made that it is self-leveling and arch-supporting. It is further claimed that it is unusually resilient and will absolutely prevent slipping. The patentee, William G. Anderson, of the Sudbury Building, Boston, is offering this heel to rubber manufacturers on royalty.

MR. EGGERS INVENTS A NEW MOLD.

A new type of mold adapted for the manufacture of both hard and soft rubber specialties, which produces excellent results and costs less than the old kind, is now being made under his own patents by William Eggers, the well-known rubber machinist of Brooklyn, New York. The weight of the new molds is much less, consequently they are more easily handled; and because of the thinner material, they are more susceptible to heat and more uniform in vulcanization. The molds are so constructed that they cannot warp and are said not to be adversely affected by heat. The metal of which they are made, while less expensive than the material formerly used, takes a very high polish, giving the rubber product a fine finish. These molds are being used by prominent manufacturers, who state that they have used them with much success.

A book for everybody interested in tires—"Rubber Tires and All About Them"—this office.

Commercial Arbitration: A Hopeful Outlook.

By Charles L. Bernheimer in the "Independent."

WHEN the New York Chamber of Commerce turned its attention to commercial arbitration, the fundamental and controlling purpose was to find a remedy for the law's delays, which President Taft, before his inauguration and many times since, declared "Amount in many cases to a denial of justice." In the final analyses one could hardly be charged with overstatement in saying that the law's delays are at the bottom of many of our present civic, political and economic disorders.

During the one hundred and forty years of its existence, the Chamber of Commerce has attempted to provide commercial arbitration in three distinct ways: The first failed because no method to enforce the award was provided; the other two because they attempted too much, for the promoters had in mind a Court of Commerce for merchants exclusively, fashioned after the Old World Handelsgerichte and Tribunaux de Commerce. Differences in laws, customs and viewpoints made such a scheme impracticable in our country.

A more modest attempt seemed in order, and quite within the realm of practicability. The controlling features of the plan now in operation under the ægis of the Chamber of Commerce, are the following:

First: Strict adherence to the provisions of the Code of Civil Procedure as found, and acceptance of their opportunities and obligations.

Second: Formal submission of the dispute, strictly in accordance with the formalities and safeguards prescribed by the existing law.

Third: Provision for a list of official arbitrators.

Fourth: Waiver of the revocation provision in the law; we are, of course, aware that there is still some question as to whether this right to revoke can be waived, but dependence has been placed upon the honor of those submitting to a tribunal instituted by and composed of fair-minded, public-spirited fellow merchants. Nothing in our experience has yet occurred to lessen this faith.

These are some of the things the New York Chamber's system actually accomplishes:

It saves money, time and trouble to the merchant, law office and State. It supplies "technical" skill for judicial decisions because, with the large membership of the Chamber (covering practically every phase of business and commercial life) the disputants can select arbitrators specially familiar with the technical and industrial data of the specific business involved.

It affords a medium for conciliation: The antagonism present in a lawsuit is lacking. Instead there is in the attempt at arbitration itself—a recognition of and respect by each side for the other's contention. In the atmosphere of openmindedness thus created, an amicable adjustment is frequently reached without actual arbitration.

It assures an absolutely impartial award—one that commands the respect of the disputants, the courts and the legal profession.

It establishes commercial equity: It applies the rule of reason to the actual facts, and it renders an award that is final and binding, one that *has the force and effect of a Supreme Court decision.* It admits of the disposal of a dispute within a short time, sometimes within twenty-four hours after it arises.

It offers the disputants the opportunity to select their own court, judge and jury; to designate the time of trial and hearing. They may, before the arbitrators selected by them, subpoena witnesses and compel the production of books and papers as they could in a court of law.

The number of cases that can be handled simultaneously by the Chamber is limited only by the number of arbitrators on the "official list," and this may be extended to include as many as fifteen hundred names.

The procedure is exceedingly informal. Usually the parties communicate with the Chamber for information; then they are referred to the chairman of the arbitration committee and supplied with a handbook of arbitration. The chairman arranges a meeting—with both parties, where possible—and, after hearing an explanation of the matter, endeavors to bring about a settlement "out of court," if he can. In other words, he attempts by conciliation to avoid both arbitration and litigation—as would a conscientious lawyer. And in a large number of the cases considered, such informal hearings have brought a satisfactory adjustment.

If arbitration is finally determined upon, the parties decide through which of the three methods available the arbitration is to proceed. A formal submission signed by both parties is placed before the committee on arbitration, which first judges whether or not the case is one that they can handle. The rules permit them to decline a case for any reason that appears to them good and sufficient.

The date of the hearing is set for a time that will suit all concerned—arbitrators and disputants. It takes place in one of the rooms of the Chamber of Commerce; the hearings and results are private, and are inaccessible even to the members of the Chamber expect by order of the arbitration committee.

In proceeding the arbitrator is sworn in before a notary or justice of the court; the arbitrator in turn places the witnesses under oath. The arbitrator then asks either of the parties to acknowledge the genuineness of the submission and to explain the situation in his own way, just as he views it, and also to present any documentary evidence he desires, and, if he has witnesses, to produce them. After the witnesses have been duly sworn, their testimony is taken. The same general method is followed in hearing the opposition. An informal cross-examination, or any other form of investigation best suited, follows, of course with the assent of both parties, under the control of the arbitrator. The proceedings are taken down by a court stenographer, and the award, including disposition of the expense item, is carefully worded and forwarded to both parties. When the submission is handed in a deposit of $60 is required from each party. This serves to defray incidental expenses, such as stenographer's fees and $10 per day—the compensation of each arbitrator. The arbitrator decides in his written award how this shall be paid and by whom. Any balance is returned to the parties.

This ends the work of the Chamber.

The law provides that the prevailing party may file the award with the Supreme Court any time within a year, and obtain judgment thereon. The court must confirm the award unless it is not in accord with the submission, or was obtained by fraud or undue influence, or shows partiality; or in case adjournments were warranted and were refused. Should the award of the arbitrator contain errors that do not affect the merits of the decision upon the matters submitted, the court must modify or correct them. Ordinarily (invariably, so far in our experience) the award has been complied with without an application to the court.

Arbitration by the Chamber is not limited to its members, nor even to citizens of this country. It serves impartially every business man bringing to it his honest differences with

another—whether he be a resident of this country or a foreigner.

The Committee on Arbitration has been frequently asked concerning its attitude toward the legal profession. The citing of a case submitted to the Chamber of Commerce about a month ago will answer:

The disagreement concerned lawyer's fees a law firm could not collect from its client. Both the lawyer and the client submitted the case to the committee and were represented by attorneys who argued the case for them. It was determined in two hearings and both parties write that they cannot speak too highly of the patience, ability and fairness displayed by the arbitrators.

The National Association of Credit Men are sympathetic in this arbitration work, keenly realizing, as they do, that a business man's assets are quickly vitiated by unsettled or pending lawsuits tying up his capital.

If the national, state and municipal governments will encourage arbitration in some form similar to that instituted by the New York Chamber of Commerce, by providing for arbitration of the disputes or differences arising between it and those furnishing supplies and labor, the number of bidders will be vastly increased and the prices and terms necessarily become more favorable to the Government. From 10 to 20 per cent. can undoubtedly be saved in its operation in this manner. At present the number of bidders on contracts is reduced because the average competent merchant, through business prudence, refuses to bid lest a dispute arise and leave him very little redress except through a lawsuit.

International commercial arbitration on its broadest basis seems a fair possibility: a system whereby the award rendered by a Chamber of Commerce of one country will be accepted and enforced by that of any other signatory to this agreement—as court decisions in one country are respected by the courts of any other country with which it is at peace.

In its very simplicity of procedure lies a great part of the strength of our plan; for the legal technicalities that, to the layman's mind so often obscure the real issue in litigation, are entirely lacking.

A FINE CATALOG OF HYDRAULIC MACHINERY.

R. D. Wood & Co., Phila., Pa., have recently issued their catalog No. 7 descriptive of hydraulic machinery for rubber mills. This is a handsome booklet of 36 large pages 8 x 11 inches in size, with effective cover of heavy paper. The company illustrates only one of its foundries—that situated in Camden; but practically all the entire 36 pages contain fine illustrations of the different hydraulic tools and machinery manufactured by this company for use in rubber mills. Among these machines so illustrated are the following: Hydraulic Operating Valves, two-pressure type; High-pressure Stop Valves, balanced type; High-pressure Check and Stop Valves, unbalanced type; Pressure Relief Valves; Closing Press; Heater Press, standard type; Heater Press, Goodrich Patent; Tire Bead Press, eight-column type; Tire Bead Press, goose-neck type; Tire Bead Press, two-opening type; Tire Bead Press, twin type; 700 Ton Rubber Press; Steam Platen Press, single-opening type; Steam Platen Press, special type; Steam Platen Press, two-opening type; Steam Platen Press, multiple-opening type; Die Chilling Press; Laboratory Press, 100-ton capacity; Tire Forcing Press, hand operated; Tire Forcing Press, power driven; Horizontal Two-plunger Pump, cross-head pattern; and Hydraulic Accumulators, inverted type.

The illustrations are to be commended not only for the artistic way in which the engraver and printer have done their work, but for the exceedingly fine detail which enables the prospective purchaser to get almost as good an idea as he would if examining the machine itself.

ONE REASON WHY SHOES BLOOM.

IF there is anything a rubber shoe manufacturer dreads more than another it is "BLOOM." It is certainly the worst fate that can befall him. It is a continuous nightmare to know that even one shoe taken out of stock shows signs of bloom.

A frequent and most generally understood reason for this trouble is that the shoes are under-cured, but there are instances when it is quite certain that the cure is complete and correct, and that shoes placed side by side in the same heater, and at unquestionably the same temperature, show that something is wrong, inasmuch as some show bloom, while on others there is none.

It usually takes a long investigation in a matter like this. Probably the very next heat will fail to show any trouble whatever.

It is my purpose to show *one* of the causes. The temperatures in the chamber were found to be correct, the varnish was right, the compounds were chemically correct; and so I finally landed where we frequently do land viz.: crude rubber. I found the trouble. We were using Centrals,—"Esmeralda" in particular. Examination of the rubber hanging up showed that about 10 per cent. of it was soft and mucky. A sheet would show some usually hard, and some soft; another sheet was all hard; while again some was falling on the floor. I mixed three batches of shoe upper stock, using three selections of the rubber, the hard, the soft, and a combination of the two. The three sheets were cured together, wrapped on a mandrel. The results were sufficient to convince anyone.

The *hard* rubber was what it should be—fully cured and elastic. The combination of *hard and soft* was under-cured quite a little in comparison, and bloomed in three days. The *soft* rubber sample bloomed in two hours; the elasticity was almost nil.

Further work in the laboratory showed the sulphur in combination varied greatly; the good sample contained practically no free sulphur, while the soft rubber had taken up such a small amount that 78 per cent. of the amount used was still in a free state, and, of course, commenced to work its way out and show in the form of bloom.

Other rubbers than "Esmeralda" act this way. Ceylons in particular need watching, while the sweated Congos are dangerous, but not so much so as the Centrals and Ceylons.

SUPERINTENDENT.

INDIA-RUBBER GOODS IN COMMERCE.

EXPORTS FROM THE UNITED STATES.

OFFICIAL statement of the values of exports of manufactures of india-rubber and gutta-percha for the month of October, 1912, and for the first ten months of five calendar years:

MONTHS.	Belting, Packing and Hose.	Boots and Shoes.	All Other Rubber.	TOTAL.
October, 1912	$236,900	$134,028	$606,963	$977,891
January-September	1,888,433	1,014,688	6,016,371	8,919,492
Total, 1912	$2,125,333	$1,148,716	$6,623,334	$9,897,383
Total, 1911	1,909,150	1,487,563	5,935,113	9,331,830
Total, 1910	1,759,590	1,906,961	4,687,399	8,353,950
Total, 1909	1,469,272	1,288,705	3,478,438	6,236,415
Total, 1908	1,049,641	1,157,136	2,940,309	5,147,086

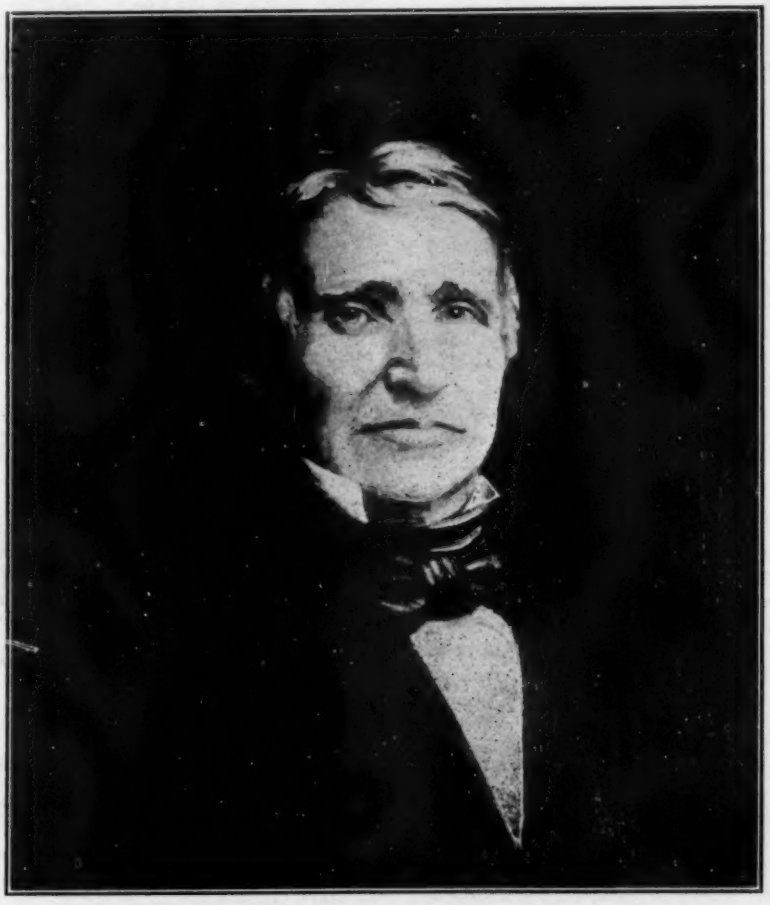
THE above heading, "All Other Rubber," for the month of October, 1912, and for the first nine months of two years, include the following details relating to tires:

MONTHS.	For Automobile.	All Other.	TOTAL.
October, 1912 ..... *values*	$225,704	$42,465	$268,169
January-September	2,533,635	443,443	2,977,078
Total, 1912	$2,759,339	$485,908	$3,245,247
Total, 1911	2,080,517	480,915	2,561,432

News of the American Rubber Trade.

A VERY FINE PORTRAIT OF GOODYEAR.

EVERYBODY familiar with Boston remembers the Goodyear Rubber House on School street. It was there for many years and was one of the landmarks of the older city. The proprietor of that rubber house was Robert Josselyn, and he had among his most prized possessions an old photograph of Charles Goodyear, bearing his signature. A niece of Mr. Josselyn, Miss Frances Chamberlin, is a portrait painter of distinction, and she has reproduced a large portrait in oils from this old photograph. The illustration below is a small reproduction of this oil painting. While this cut, of course, gives but an inadequate idea of the painting, at the same time it conveys at least a suggestion of the excellence with which the work has been done. Not only is the face full of character, but it is unquestionably one of the best likenesses extant of the famous old rubber pioneer.



A NEW PORTRAIT OF GOODYEAR.

RUBBER IN CONGRESS.

An appeal was recently introduced in Congress by Representative Raker of California, providing for the appropriation of $5,000 for the investigation and study of the methods of growing and testing sage-brush and grease-wood for the production of rubber, alcohol and acetic acid. $5,000 will not cover the normal expenses of a large number of inspectors over a protracted period of time, but still, if the bill is passed, it would be an official recognition of the possibility of producing rubber from plants indigenous to the United States.

UNITED STATES RUBBER CO.'S FOOTWEAR PRICES, 1913.

The United States Rubber Co. has issued its new gross price list on Rubber Footwear, which goes into effect on January 1, 1913. The discounts are the same as those announced on February 1, 1912, which include a premium of 5 per cent. for early orders.

Where certain styles are packed both in bulk and in cartons, a common gross price has been made, which is the carton gross price. This change was made at the request of the wholesale and retail trade of this country.

TIRE EXPORTS INCREASING.

Tire exports from the United States show a substantial increase for the year just passed over the preceding year. The value of the exports for the first nine months of 1912 amounted to $3,025,736 as against $2,375,268 for the same period in the preceding year—being an increase of over 30 per cent.

THE GUTTA PERCHA & RUBBER MFG. CO., OF TORONTO, LTD., TO BE REORGANIZED.

There is to be a reorganization of The Gutta Percha & Rubber Manufacturing Co. of Toronto, Limited, whose factories are located in Toronto (Parkdale). The reorganization will take effect as of January 1, 1913. The company has carried on an extensive business throughout Canada, and by export to various parts of the world for over a quarter of a century, having been incorporated as a purely Canadian industry under the Ontario Joint Stock Companies' Act in 1887.

As the business of the company grew, it became necessary to open branches in many places. At some points these branches were operated under the name of "The Gutta Percha & Rubber Mfg. Co. of Toronto, Ltd.," but in the Prairie Provinces the business has been conducted at Winnipeg and Calgary through a subsidiary company, The Winnipeg Rubber Co., Ltd., and in British Columbia through another subsidiary company, the Vancouver Rubber Co., Ltd. The directors and shareholders of the company have now decided to operate in all its branches under one name and at the same time adequately care for and develop its very large and constantly increasing business. To this end, application has been made for a Dominion charter under the name "Gutta Percha & Rubber, Limited," with an authorized capital of $6,000,000. The new company will be controlled by the same interests and be under the same management as the old. It will acquire all the trade-marks, patents, properties and good-will of the old company and, as heretofore, will be an entirely independent concern without connection or affiliation with any other company in or out of Canada.

CALENDARS, CARDS AND BOOKS RECEIVED.

The handsome calendar is a souvenir of which the trade never tires—as a calendar of some sort is obviously a necessity, and quite as obviously, a handsome calendar is preferable to one that cannot be so described. A number of desirable calendars have been received at this office.

The Lebanon Mill Co., Pawtucket, Rhode Island, which manufactures knitted fabrics, has favored its customers with a very dainty calendar, the full size of which is about 9 x 20 inches. It consists of a reproduction in water color effects of a handsome young woman set off with a sizeable corsage bouquet of violets and pansies. A unique feature of this calendar is its multiplied mounting—the picture being mounted on a drab board, which in turn is mounted on grey, and that again mounted on a piece of drab—the whole being tied at the top with a pearl grey ribbon. Its delicacy would suggest that as a rule this calendar would be carried home rather than being left in the office.

The Derby Rubber Co., Derby, Connecticut, engaged in the manufacture of reclaimed rubber, has a calendar somewhat similar in its general appearance to the one described above, but different in its dimensions. This is about 14 inches square. It has a water-color face on a panel at one side, and is tied with a silk cord at the top. This panel also has a double mounting—first on a heavy cream cardboard, and that in turn upon a board of green. This calendar, like the one mentioned above, is suited for home consumption.

The Apsley Rubber Co., Hudson, Massachusetts, has supplied its customers with one of those exceedingly convenient desk memorandum calendars with a week on each page and enough space opposite each day to make any important memoranda that it may be necessary to make. The calendar is 5½ by 8½ inches in size and has a cover and a mount of mottled green printed in gold, which gives it a rich and artistic effect.

The New Jersey Rubber Co., Lambertville, New Jersey, manufacturing reclaimed rubber, is distributing a number of "The Handy Memorandum Desk Calendars" which have a page for every day in the year, the front of the page giving the day of the month and underneath that in small type three whole months, while on the back there is ample space for any memoranda. The leaves are 3 by 4 inches in size, which gives abundant writing space. These leaves are intended to be placed on the little metal frames that are familiar to users of this sort of calendar. A good many business men wouldn't feel that they could start their day's work until they had turned over a page in one of these familiar desk conveniences.

The American Asphaltum and Rubber Co., of Chicago, Illinois, has favored its customers with a very convenient little leather pocket-book, having a pocket at one side containing a celluloid calendar for 1913, and on the other side a memorandum pad supplied with a number of small memorandum slips about 2½ by 4 inches in size. This is a souvenir that anybody might be pleased to get.

The Dunlop Tire and Rubber Co., Toronto, Canada, has distributed a little Christmas booklet of 16 pages and cover printed in red and green and black, giving in a humorous vein the story of its 20 years of successful operation.

White & Reid, rubberizers of textile fabrics, Hoboken, New Jersey, have mailed to many members of the rubber trade an engraved folder ornamented with a spring of holly, extending the compliments of the season, and wishing their customers and all their employees a happy and prosperous New Year.

The Derby Rubber Co., Derby, Connecticut, has favored some of its friends with a particularly convenient pocket memorandum book 3½ x 5½ inches in size, having a flexible leather cover in which is inserted a pad of about 100 leaves provided with a sheet of carbon paper, so that one may not only make a memorandum, but also keep a copy of the same. The leaves are perforated at the top so as to be easily detached. An additional pad goes to complete the equipment—a very great convenience—particularly for the traveling man who wants to send a memorandum to the home office and still keep a copy himself.

The Selby Shoe Co., Portsmouth, Illinois, mailed at Christmas time to its customers, a seasonable card ornamented with gilt bells and holly sprigs, carrying the company's good wishes for a happy Christmas and a prosperous New Year.

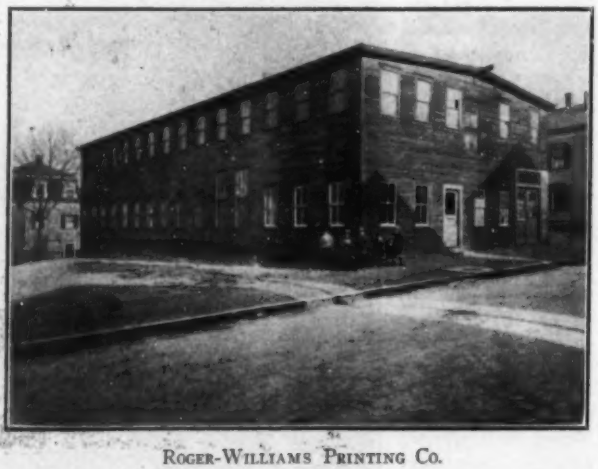
LECTURING ON RUBBER.

Mr. C. H. Guild, Jr., connected with the general manager's office of the United States Rubber Co., and son of C. H. Guild, treasurer of the Woonsocket Rubber Co., gave a lecture recently in Brooklyn (to which the "Brooklyn Eagle" devoted nearly half a column) on "The Biography of a Rubber Shoe from the Tree to the Foot," in which he described the processes through which rubber goes from the time it leaves the tree as cream-like latex to the time that it goes on the foot as a rubber shoe—and beyond that through its post-mortem and revivification as reclaimed rubber. Mr. Guild illustrated his lecture by samples of crude rubber, and by making a shoe where all the spectators could watch the operation.

There is so much interest in rubber these days because of the extremely important position it occupies among the industries of the world that a good lecturer on the subject can always command an attentive audience.

PRINTERS WHO PRINT ON RUBBER.

Printing establishments are innumerable in this country, as the output of literature of one sort or another is voluminous and unceasing; but printers who print on rubber are scarce. The



ROGER-WILLIAMS PRINTING CO.

Roger-Williams Printing Co., of Providence, Rhode Island, print on all kinds of rubberized fabrics. They print a great many handsome designs in many colors, as was shown in THE INDIA RUBBER WORLD for last March. Their work has been very successful, and they have been compelled recently to add considerably to their quarters. This added space is shown in the cut of the building given below. They print in fast colors that have been thoroughly tested and are guaranteed not to injure rubber in any way.

SCHRADER TAKES THE TWITCHELL PATENT.

A. Schrader's Son, Inc., of New York, has acquired the entire right, title and interest in the Twitchell tire gauge patent. This acquisition, together with the Schrader patents already owned by the company, places the entire tire pencil-gauge business in the hands of this company.

THE UNITED STATES RUBBER CO.

THE daily press of late has been devoting an unusual amount of attention to the affairs of the United States Rubber Co. Some Western papers—particularly Chicago and Cleveland papers—have felt quite positive that there was to be some sort of a merger between the United States Rubber Co. and the B. F. Goodrich Co.—either that the United States would absorb the Goodrich or that the Goodrich would absorb the United States—or that they would mutually combine—each half absorbing the other, and forming a company representing in capitalization and bond issues a quarter of a billion dollars.

RUMORS OF CONSOLIDATION DENIED.

But all these rumors are industriously denied by the officers of the United States Rubber Co., on one hand, and the officers of the B. F. Goodrich Co., on the other. Notwithstanding these denials, some of the Western papers have exploited the topic at a considerable length, stating that the competition between the two great corporations was being felt keenly by both—and particularly in the tire department—and that a consolidation would be greatly to the interest of both. It seems hardly likely, however, in the present—and prospective—attitude of the people at Washington, that any such merger will be attempted.

6 PER CENT. COMMON DIVIDEND?

Another theme to which certain members of the daily press have devoted some attention is the possibility of an increase of dividend on the common stock of the United States Rubber Co. The "Christian Science Monitor" of Boston, in a recent issue, contained this interesting paragraph:

"In connection with the recent advance in the common stock of United States Rubber it is rumored that the dividend would be increased from 4 to 5 per cent. There is, however, excellent authority that the new rate will be 6 per cent. Action may be taken next month and it may not be taken for three months, it is said."

The "New Haven Register," a publication that from time to time prints quite a little information about the big rubber company, discourses as follows:

"It is understood that including undivided profits of its various subsidiaries the company is earning so far this fiscal year at the rate of 20 per cent. on its former $25,000,000 common stock. This is at the rate of 16 per cent. on the present outstanding common. From a neglected issue, Rubber common has become a considerable center of speculative activity, largely on buying of interests closely identified with the directorate.

"While it is too early as yet to talk definitely regarding a further increase in the common dividend rate, there are bankers close to the company who expect to see 6 per cent. within the next eighteen months."

But, as stated in our December issue, inquiry at the head office of the company in New York brings the answer that increase of dividends on the common stock is a subject that has received no consideration by the directors of the company.

The directors of United States Rubber Co. at their meeting December 5, voted to authorize the officers of the company to carry out the action of the stockholders last spring providing for the retirement of the Second Preferred Stock of the company by the purchase of the same and the issue of three shares of First Preferred Stock for each four of Second Preferred Stock. They also voted to offer to the outside holders of the Rubber Goods Manufacturing Co. Preferred Stock—amounting to $2,413,900—the privilege of exchanging their stock for the First Preferred Stock of the United States Rubber Co.

At a meeting of the directors of the General Rubber Co., held on the same date, action was taken for the increase of the capital stock of the company from $5,000,000 to $10,000,000 to provide additional funds for the investments of that company in the Far East. All matters pertaining to the Crude Rubber interests of the United States Rubber Co. are handled through the General Rubber Co.

THE UNITED STATES TIRE ANNOUNCEMENT.

The publicity department of the United States Tire Co.—one of the constituents of the United States Rubber Co.—makes the following announcement regarding the company's tire plans for the coming year:

"The greatest daily output ever considered possible in tire manufacture is provided for in next year's plans of the United States Tire Co. This concern, which operates four great plants, plans an expenditure of over $3,000,000 in factory improvements and extensions. First of all, the Morgan & Wright plant, which is located in Detroit, is to be doubled in both area and production. An idea of the extent to which this factory will be increased may be gained from the fact that whereas its employes now number 2,500, 6,000 workmen will be required when all the improvements are finished. The output of the factory will be in excess of 5,000 tires daily.

It is planned to erect sixteen new factory buildings, ranging in size from 2,000 square feet to 131,000 square feet. Among these will be a finely appointed laboratory, where the scientific experimental work incident to the manufacture of automobile tires can be carried on; several vast warehouses, and at least half a dozen great manufacturing buildings—the largest of these to be 230 x 60 feet and six stories high. A big new power plant also will be installed, doubling the boiler capacity of the factory. When all of this work is finished, the Morgan & Wright plant will have a floor space of more than 1,000,000 square feet, twice its size at the present time.

"In addition to its big Detroit factory, the United States Tire Co. operates extensive rubber works in Indianapolis, Hartford and Providence, and it is the intention to increase the facilities of all these plants. At Indianapolis a building 80 x 170 feet and six stories high is being erected. At Providence another structure, 75 x 300 feet and three stories high, will be added, while at Hartford a fine new power house and power plant have been installed at a cost of more than $175,000."

THE DOMINION RUBBER CO.

The Dominion Rubber Co., of Toronto has just been organized by a number of prominent Toronto men, with a capital of one million dollars, to engage in the manufacture of all kinds of automobile, truck, bicycle, motorcycle and carriage tires, and a full line of belting, hose, packing, etc. The plant will be built in Toronto, and will be of considerable size. Mr. John J. Main, former vice-president and general manager of the Polson Iron Works of Toronto, director of the Dominion Radiator Co., and president of the Policyholders Life Insurance Co. of Toronto, is the managing director; Mr. W. R. Blowers, who resigned from the Independent Tire Co. of Toronto, some time ago, is general factory manager, and W. Deane Tyrer is the general manager of sales.

A NEW TIRE COMPANY FOR BRIDGEPORT.

The Polack Tire & Rubber Co., is not exactly a new company. The original Polack Company began business in 1863 in Waltershausen, Germany, making fire hose and other rubber goods. When the auto industry came into being the Polack company took up the manufacture of tires on a very large scale. It employs 2,000 hands at its big German plant, and has in addition thriving plants in Paris; Shepherd's Bush, England, and Sydney, Australia. In all of its factories it makes a high grade solid truck tire, and also a line of pneumatic tires. It has been looking for some time for a location in the United States, and has decided upon Bridgeport, Connecticut, where it has secured a small factory building, formerly occupied by a copper company. It is installing machinery and intends to start in the manufacture of tires in a small way immediately. It hopes later to build its own factory in Bridgeport with equipment for a very large output. This plant is in charge of Herman W. Polack, the company's vice-president.

PERSONAL MENTION.

Mr. William Keyes, formerly with Prescott Bros., Boston, is now traveling in the South for the Chicago Rubber Clothing Co., of Racine, Wisconsin, and has booked some very large orders for "at once" and future delivery.

E. T. Carnahan has resigned from the sales force of the Swinehart Clincher Tire & Rubber Co., and will travel in the East for the Firestone Tire Co., with headquarters at Buffalo.

T. B. Goodlee has been made manager of the United States Tire Co., Atlanta branch. He was formerly manager of the company's branch at Richmond, where he has been succeeded by J. G. Given from the Philadelphia organization. The United States Tire Co.'s branch in Dallas, Texas, is now under the management of W. F. Gordon, formerly with the United Motor Co., Dallas. This branch covers the States of Texas, Louisiana, Mississippi and part of Alabama.

MR. MINITER WITH RAYFIELD.

N. H. Miniter, who for several years has been sales manager of the Stromberg Motor Devices Co., has resigned his position with that concern and is now associated with the Findeisen & Kropf Manufacturing Co., of Chicago, as factory sales manager. He will in future represent the Rayfield Carbureter throughout the country.

F. C. HOOD, GENERAL MANAGER.

On December 1, 1912, Mr. F. C. Hood retired as treasurer of the Hood Rubber Co., and will hereafter act as general manager, with his office at the Factory Administration Building in Watertown, where the company has consolidated all its business offices including the purchasing department, foot-wear sales department, tire sales department, and accounting department. Mr. A. N. Hood will succeed Mr. F. C. Hood as treasurer, and Mr. J. E. Stone will become assistant treasurer, with offices as heretofore at 103 Bedford street, Boston.

A DIAMOND PIN FOR MR. CROCKER.

Mr. Isaac Crocker, treasurer of the Hope Rubber Co., of Providence, the company that operates a chain of rubber stores through New England and the Middle States, sailed for Florida and the Panama zone a few days ago, and just before sailing he was decoyed by his employes into one of the Providence hotels, given a Christmas dinner, and presented with a handsome diamond stick-pin. Mr. Crocker was taken quite by surprise, but responded appropriately to the complimentary speech of presentation.

AN ALDEN CHRISTMAS CAROL.

Geo. A. Alden & Co., of Boston, are famous for the individual character of their advertising. They are now sending out to the trade a little booklet of 4 pages and ornamental cover, entitled "Wishing You A Me Rry Xmas," etc., in which it will be noticed that certain letters in "Merry Christmas" represent the famous M. R. X rubber substitute manufactured by the company. The opening stanza of the carol is as follows:

"'Twas the night before Christmas,
When all through the mill,
M. R. X. made by Alden
Was used with good will."

And the rest of the carol maintains this same poetic level.

VALIDITY OF THE ADAMS TIRE TREAD PATENT.

In July, 1911, Judge Platt, in the United States District Court, Hartford, Connecticut, declared against the application of the Calvin T. Adams patent, No. 609,320, to heavy automobile tires, in the suit of the Metallic Rubber Tire Co., against the Hartford Rubber Works Co. On the dismissal of the suit, the plaintiffs appealed, with the result that Judge Platt's decision has been reversed in the Court of Appeals by Judge Noyes.

The patent is for preventing the yielding tires of bicycles and other wheeled vehicles, from slipping in the roadway, as they are particularly apt to do when the roadway is smooth and wet.

THE CHICAGO RUBBER CLOTHING CO.'S NEW FACTORY.

The Chicago Rubber Clothing Co., of Racine, Wisconsin, will have completed by January 15 a new three-story and basement brick factory, mill construction, 62 feet wide by 117 feet long, the upper floor of which will be devoted to the manufacture of men's and women's "Slip Ons," both single and double texture. They have installed a number of new and up-to-date machines and this new factory—combined with a 50-foot addition to their spreading department—will enable them to double their output. The year just closed has been the most successful the company ever had in its 28 years.

THE PORTAGE CO. DOUBLES ITS OUTPUT.

The Portage Rubber Co., incorporated in the state of Ohio, and capitalized at $1,000,000, is putting up a new building to add to its plant in Barberton, Ohio. When this building is completed the company expects to double the output of its auto tires and tubes.

ANOTHER HOPE STORE.

The Hope Rubber Co., which already had nine rubber stores that do both a wholesale and retail trade, has now added a tenth store, situated at Portland, Maine. Its chain of stores covers most of the New England States and one or two of the Middle States. They are operated by Mr. Isaac Crocker, treasurer of the company, who is located at the Providence, Rhode Island, store.

TWO BIG FINES.

Suit has been brought by the United States government against the American Stepney Spare Wheel Co., and the Neumastic Tire Co. A fine of $10,000 is claimed from each company, for failure to make returns under the corporation laws.

THE UNDERWRITERS' LABORATORIES AND THE INSULATED WIRE INDUSTRY.

Editor, INDIA RUBBER WORLD:

In a recent number of the "Journal of Industrial and Engineering Chemistry" (November, 1912, page 856) Mr. G. H. Savage, a rubber specialist well known in the chemical fraternity, calls attention to the Cottle Extraction Apparatus designed by G. T. Cottle of the New York Insulated Wire Co.

It appears from the article that the Underwriters' Laboratories have borrowed—to use a euphemism—the design of the apparatus and the "Methods of Analysis." The author states that the "Methods" are actually the joint work of several chemists of the insulated wire industry, who completed the work without the smallest assistance from the Underwriters' Laboratories. After several unessential changes these instructions were actually published as the "Underwriters Laboratories Methods for Chemical Tests of Rubber Compounds, etc." This attitude of the Official Laboratory of the National Fire Protection Association is interesting in view of the Editorial which appeared in THE INDIA RUBBER WORLD for December, 1912. CHEMIST.

UNITED STATES TIRE CO. ENLARGING BRANCH SYSTEM.

In addition to the changes in staff of agents noted elsewhere the United States Tire Co. is opening new sub-branches at Washington, D. C.; Newark, New Jersey; Birmingham, Alabama; Rochester, New York; and Milwaukee. It is also in contemplation to open sub-branches at Providence; Worcester, Massachusetts; Baltimore; Syracuse, New York; as well as Columbus and Toledo, Ohio.

PROPOSED AUTO ROAD ACROSS CONTINENT.

AT a banquet attended by some 300 Indiana automobile manufacturers and dealers, the amount of $800,000 was subscribed towards the construction of a macadam roadway from New York to San Francisco. The length of the road would be 3,349 miles, and the total estimated cost $25,000,000.

THE CHEMIST AND THE ENGINEER IN THE RUBBER INDUSTRY.

In a recent circular letter to the rubber industry, Messrs. Frederic Dannerth and Hubert E. Collins announce the opening of their new office in New York City. The announcement incidentally points out to the rubber manufacturer, several lines along which the consulting chemist and the consulting engineer can be of service to the several departments in the rubber works. It is probably well known to many of the leading manufacturers, that Messrs. Dannerth and Collins have rendered such services for a considerable period, but the announcement states the character of the work concisely and clearly. Those who have not yet received copies of the announcement can secure one by sending a post card request to their offices at 110 West 34th street, New York. Mr. Collins has been practising as a consulting engineer since 1902, and has in that time acquired a reputation as an expert in power plant efficiency. His professional work has taken him from coast to coast and as far south as the city of Belem-Pará, the hub of the wild rubber industry. Mr. Frederic Dannerth has back of him an extended experience as a consulting industrial chemist, and has devoted a large part of his time to problems peculiar to the rubber industry. His activity as advisory chemist to rubber manufacturers has never been given publicity, chiefly because such services are, as a rule, confidential and "not for publication." This attitude toward his clients has won for Mr. Dannerth an enviable reputation.

THE EMPIRE TIRE AND RUBBER CO.

The Empire Tire and Rubber Co., Trenton, New Jersey, has been incorporated with a capital of $1,000,000—$500,000 common stock and $500,000 preferred stock—to take over the business of the Empire Rubber Manufacturing Co. and the Empire Tire Co. The officers of the new company are Charles H. Baker, president; C. Edward Murray, treasurer, and A. Boyd Cornell, secretary.

NEW OFFICERS FOR REPUBLIC RUBBER CO.

At the directors' meeting of the Republic Rubber Co. on November 27 the following elections were made: L. T. Petersen was chosen first vice-president, succeeding L. J. Lomasney, deceased. John H. Kelly was chosen second vice-president and director, succeeding L. T. Petersen as second vice-president. A. H. Harris was chosen a director of the company, filling the remaining vacancy on the board.

THE MYSTIC CO. REORGANIZES.

The Mystic Rubber Co., located in West Medford, Massachusetts, for the past three years, manufacturing dress shields, rubber sheeting and rubber specialties, has reorganized under the same name with the following officers: Herman T. Dean, president; William B. Marshall, vice-president; Herbert A. Derry, general manager. Edmond N. Warner will continue in charge of the factory, acting as superintendent. They are negotiating for new machinery and expect to branch out in several lines. This plant has a most advantageous location.

A NEWARK TIRE CO.

The "Best Tire Co.," of Newark, completed its permanent organization on December 7. The president is S. L. Henry, of Newark, the secretary and treasurer is Edward Spillane, and the board of directors are S. L. Henry, Edward Spillane and Martin Walker. The office of the company is at the above address, which is also to be the sales office. The capital stock is $125,000 divided into 125,000 shares, all common. The company has purchased the right to manufacture and sell an automobile tire that is constructed on a new model and which is a radical departure, both in design and principle, from any of the tires so far proposed or placed on the market.

TRADE NEWS NOTES.

THE Atlas Tire Co., incorporated in New York, with salesroom at 1771 Broadway, New York, is engaged in the wholesale and retail jobbing of tires and tubes of all standard makes and is now arranging for factory facilities for the manufacture of special brands of casings.

The general tendency of tires seems to be in the direction of the larger sizes, but the American Tire & Rubber Co. of Akron has just sent out some tires that show a distinct movement in the other direction. These tires are half an inch thick and only 2¼ inches in diameter. They evidently are not intended to go on any wheels now in existence, but rather are intended to go on the desk or table—probably as paper weights—though in reality they would serve an excellent purpose as mats, under a stein, for instance.

The John W. Wood Elastic Web Co., of Brockton, Massachusetts, intends to build an addition to its factory, 60 x 80 feet, with fireproof material. This will about double the factory's manufacturing facilities.

The Lyon Rubber Co., of Akron, Ohio, has awarded a contract for a two-story and basement factory.

The Connecticut Mills Co., Danielson, Connecticut, is installing a 50 per cent. increase in its equipment, which is expected to be ready for operation early in February.

The De Leon Tire and Rubber Co., Trenton, New Jersey, incorporated a few weeks ago, with a capitalization of $500,000, is getting bids through the architects for a two-story factory, 245 x 60 feet.

The Chicago Rubber Clothing Co., Chicago, Illinois, expects soon to build a two-story factory, 126 x 60 feet.

It is reported that George M. Anderson and J. S. McClurg, of Akron, Ohio, and N. F. Sanford, of Pittsburg, are looking for a site in Pittsburg for a rubber reclaiming mill.

The Independent Tire Co., of Guelph, Ontario, expects very soon to have its plant in operation.

The American Hard Rubber Co., College Point, New York, expects to make a three-story addition to its present plant.

The Seamless Rubber Co., New Haven, contemplates an addition to its plant, 60 x 100 feet and two stories high.

Plans have been filed for the erection of a four-story brick factory to cost $225,000 for the Goodyear Improvement Co., of Akron, Ohio, at Long Island City, New York.

The Canadian Consolidated Rubber Co., Ltd., has declared regular quarterly dividends of 1¾ per cent. on its preferred and 1 per cent. on its common stocks, payable Jan. 1, to holders of record Dec. 21.

The Walpole Rubber Co. has declared the regular quarterly dividend of 1¾ per cent. on preferred stock and 1 per cent. on common, payable Jan. 15 to stock of record Jan. 1.

The Continental Rubber Works, of Erie, Pennsylvania, have been for a number of years producing an extensive line of bicycle tires, the distinguishing mark of which was and is a knurling—or indentation. The Continental Works have recently served notice on tire manufacturers who have been using this registered trade-mark, which, as already stated, is characterized by a zig-zag corrugation, that they will take action against concerns—either making or selling—tires bearing this mark. It is especially used by the Continental Rubber works for the purpose of individualizing their single tube bicycle tires.

The Wellington Rubber Co., with headquarters at 79 Milk street, Boston, and a factory located at Medford, Massachusetts, are doing spreader work and making carriage automobile goods, as well as cloth for surface clothing. It is a Massachusetts corporation with a capital of $25,000. The president is F. F. Silliman, and the treasurer E. B. Silliman.

TRADE NEWS NOTES.

The Motz Tire and Rubber Co., of Akron, Ohio, which has hitherto been represented in New England by an agency, has now established a branch factory in Boston.

The Bourne Rubber Co., of Providence, Rhode Island, has commenced the manufacture of automobile tires, its product being designated as the "Bourne-Goodyear" tire. It has, however, no connection with any other tire company.

The Tire Core Co., of America, New York, the Eastern distributor of the Dahl tire filler, has filed schedules in bankruptcy.

Contracts have been awarded for the erection of a factory building at Clermont and Atlantic avenues, Brooklyn, by A. Schrader's Sons, Inc., makers of the well known Schrader valves and tire gages.

The Etablissements Bergougnan, of Clermont-Ferrand, France, the large tire makers, are preparing to open a branch selling office in New York City, for the purpose of introducing their tires in the American trade. They are said to contemplate subsequently establishing a factory in America.

The Seamless Rubber Co. have removed from 2007 Broadway, to 250 West Fifty-fourth street, New York, from which address the entire United States sales are now handled; the offices of the company being also located there.

The Atlas Tire Co., New York, has been registered to deal in motor car tires.

The Dayton Airless Tire Co., of Dayton, Ohio, has recently opened a branch at 803 Race street, Cincinnati.

The McNaull Automobile Tire Co., of Toledo, Ohio, has increased its capital from $50,000 to $75,000.

The Detroit Puncturine Company, recently incorporated, is making a compound intended to heal punctures in tires, and cure in the envelope.

A meeting of the stockholders of the McGraw Tire Co., of Pittsburgh, is called for January 27, to consider a change in the by-laws.

The Dayton Airless Tire Sales Co., of Cleveland, Ohio, has been incorporated to deal in automobile tires and supplies.

For the cultivation of south western business, the Cutting Motor Car Co., of Jackson, Michigan, is about to establish a factory at Kansas City; from which point the trade of Missouri, Texas, Oklahoma, Kansas and New Mexico will be handled.

The L. & M. Co-operative Tire Association, Chicago, has been registered under Illinois laws, to deal in motor car tires.

Various changes are reported in the western staff of the Diamond Rubber Co. H. M. Fauvre has been promoted from the management of the Indianapolis branch to that of the Chicago branch, being succeeded at the former point by O. C. Reavell, from the Kansas City office.

The Universal Wheel Co., Fort Wayne, Indiana, making punctureless auto wheels, has let the contract for the erection of its $150,000 plant.

The Heilbron Rubber Co. has opened up premises at East Union street, Pasadena, California, where "Gibraltar" tires will be kept in stock.

Ballon & Wright, the well-known Portland (Oregon) jobbers, are about to open a branch store in Seattle, Washington, under the management of A. J. Jones, former manager of the United States Tire Co.'s branch at the latter point.

The Mosher Rubber Co., of Los Angeles, has been purchased by Franz O. Nelson, former branch manager of the Diamond Rubber Co., and Frank T. Price, a Diamond tire adjuster. They will deal in tires and perform vulcanizing work.

RUBBER IMPORTS NOW AND TEN YEARS AGO.

The value of manufacturers' materials imported into this country during the year 1912 exceeded $900,000,000—or double what it was ten years ago. Of this great importation about $100,000,000 will represent the importation of crude rubber. The figures for the entire year are not now at hand, but for the ten months ending with October 31, the crude rubber imports amounted to 97,000,000 pounds valued at $82,000,000 which would bring the total for the year about 120,000,000 pounds with a valuation close to the $100,000,000 mark. The figures for the same ten months of 1902 were 41,000,000 pounds with a value of $20,000,000.

RUBBER LEADS IN RAW MATERIAL IMPORTS.

According to advance sheets of the statistics for the fiscal year 1912, the imports of the principal raw materials for that year were:

India rubber, gutta percha and substitutes	$105,034,556
Hides and skins	102,371,585
Silk	69,796,848
Chemicals, etc.	58,167,903
Tin	46,227,460
Copper	45,045,222
Wool	14,454,234

Rubber thus takes the lead among industrial raw materials imported; being with the exception of coffee, the largest article of import.

IMPORTS OF CRUDE RUBBER.

The total is given below of the imports of crude rubber into the United States for the 12 months ending June 30, during the last three years, and for the 10 months ending October 31, for the same period. It will be noticed that the imports for 1911 were materially below those for 1910, but that the increase for 1912 carried the figure considerably beyond that for 1910.

FOR FISCAL YEARS ENDING JUNE 30.

	Pounds.
1910	101,044,681
1911	72,046,260
1912	110,210,173

FOR TEN MONTHS ENDING OCTOBER 31.

	Pounds.
1910	77,691,446
1911	66,334,189
1912	97,308,544

THE REPORT FROM PUTAMAYO.

Consul Stuart Fuller, who was sent by the American government to investigate the atrocities in the Putamayo district in Peru, and particularly to discover if—as has been stated by the Peruvian government—these atrocities have been entirely stopped, has returned to the United States with his report. He reached Washington on December 23, and immediately conferred with the officials of the State Department. The contents of his report have not been made public, but there is ground for the surmise that cruelty is still being practised upon the defenceless natives in that unhappy country; and it is believed that the report presents a very delicate problem for the State Department to handle; especially as many of the rubber gathering interests in that country are in the hands of British citizens.

THE JANUARY AUTO SHOWS.

As noted in THE INDIA RUBBER WORLD of December, the automobile manufacturers will hold their annual shows from January 11 to January 25. The two shows will take place concurrently in Madison Square Garden and at the Grand Central Palace; the second week, beginning January 20, being specially devoted to motor trucks, delivery wagons and accessories. The Chicago show follows from February 1 to 8.

RUBBER TRADING CO. ELECTS NEW OFFICERS.

At a recent meeting of the stockholders of the Rubber Trading Co., Collier W. Baird and Robert L. Baird were elected directors, and later at a directors' meeting, Collier W. Baird was elected assistant treasurer, and Robert L. Baird was elected assistant secretary.

WILLIAM T. BAIRD,
President and Treasurer.

This company—one of the most important in the crude rubber field—had its inception in March, 1902, and since that period has developed to its present important growth.

The Rubber Trading Co. today enjoys the confidence and patronage of a very large number of the rubber manufacturers of this country and Canada, and has through effective methods and honest management established a most lucrative and extensive business. Its European connections are of a very desirable character and its buying facilities excellent.

The home offices are located at 38 Murray street, New York, with connections in principal rubber centers. The company handles practically every variety of crude rubber, and its offerings are invariably regarded as dependable.

The gentlemen comprising the executive staff of the Rubber Trading Co., at this time are Mr. William T. Baird, president and treasurer; Robert B. Baird, vice-president and secretary; Collier W. Baird, assistant treasurer and Robert L. Baird, assistant secretary. Mr. William T. Baird who from 1892 until 1902 was prominently identified with The New York Belting and Packing Co., of which he was—during the latter period of his connection—the secretary. Later he was identified with the Mechanical Rubber Co., as secretary and treasurer; so that when he came to the Rubber Trading Co., he brought a wide experience which has contributed in no little degree to the success of that organization, and he is today recognized as one of the most effective credit men in the rubber trade.

ROBERT L. BAIRD,
Assistant Secretary.

The vice-president and secretary of the company is Robert B. Baird, who from 1892 until 1899 was connected with The New York Commercial Co., and George A. Alden & Co., and from 1899 until the start of the Rubber Trading Co., operated under his own name. Mr. Baird conducts the selling end of his concern and it is a safe assumption that there is no more successful, popular, or competent crude rubber salesman in the trade today, and the volume of business which has resulted from his efforts may no doubt be ascribed in a large measure to his unusual energy, honest representation, and to "the smile that won't come off."

ROBERT B. BAIRD,
Vice-President and Secretary.

Mr. Baird spends a large proportion of his time in traveling through the various rubber centers of the country, where he is very well known, and where his presence is always welcome. He is naturally of a very cheerful and helpful disposition, and he has always had the confidence and respect—not only of his customers but of competing rubber men as well. In 1911 Mr. Baird went to London as the commissioner of the Rubber Club of America to the Second International Rubber and Allied Trades Exhibition, and incidentally toured Europe with his family. During his visit he called on various members of the trade in Great Britain and on the Continent, cementing many old friendships and establishing a number of new and profitable connections.

Robert L. Baird, son of Mr. Robert B. Baird, and the present assistant secretary of the Rubber Trading Co., became identified with the company in 1907, and at the present time he is well and favorably known to the rubber manufacturing trade.

COLLIER W. BAIRD,
Assistant Treasurer.

Collier W. Baird, who is now assistant treasurer of the company, is the son of Mr. William T. Baird, and is a graduate of the Sheffield Scientific School of Yale. His connection with the company commenced September 16, 1910, and he has already shown remarkable aptitude in his department.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED NOVEMBER, 1912.

NO. 1,043,061. Quick demountable block-tire. P. B. Bosworth, assignor to the Firestone Tire & Rubber Co.—both of Akron, Ohio.
1,043,062. Tire-grip. R. A. Brenl, Bridgeport, Conn.
1,043,075. Resilient wheel. F. E. Day, Everett, Mass.
1,043,143. Tire fabric. H. K. Raymond, assignor to The B. F. Goodrich Co.—both of Akron, Ohio.
1,043,149. Life-saving device. J. Schwab, Winnipeg, Manitoba, Canada.
1,043,208. Means for mounting punctureless tires on wheel-rims. B. Dahl, Minneapolis, Minn.
1,043,373 Tread for tires, etc. G. C. Taylor, Helsby, England.
1,043,407. Pneumatic tire. A. A. Dennis, Grand Rapids, Mich.
1,043,424. Tire-removing tool. H. Hevey, Biddeford, Me.
1,043,525. Elastic-webbing. W. Kops, assignor to Kops Bros., New York.
1,043,571. Resilient wheel. D. L. Crosbie, Sacramento, Cal.
1,043,620. Bottle-closure. J. Marian, Pressburg, Austria-Hungary.
1,043,642. Resilient-tire. H. A. Stoneham and C. T. Schwarze, South Orange, N. J.
1,043,647. Hose-Reel. C. Wagner, Grantwood, N. J.
1,043,658. Tire-rim. J. D. Anderson, Kansas City, Mo.
1,043,677. Pneumatic cushion for vehicles. J. O. Davis, Pawnee, Okla.
1,043,752. Tire-supporting case. E. R. Bolz, Somerville, Mass.

Designs.

42,214. Vulcanizer. A. M. Baugh, Omaha, Neb.

Trade Marks.

57,833. La Crosse Rubber Mills Co., La Crosse, Wis. Indian-head in a circle. For rubber boots and shoes.
59,300. The Miller Rubber Co., Akron, Ohio. The letter *M* in a circle. For adhesive rubber-cement and rubber-tire dough for repairing rubber articles.
59,904. Imperial Rubber Co., New York. The word *Premier*. For rubber belting, etc.
60,721. Edward James, Cleveland, Ohio. The word *Gyroheel*. For rubber heels.
61,248. Charles A. Daniel, Philadelphia, Pa. The letters *aniel* inside a large *D*. For rubber and fabric packing.
63,853. The Diamond Rubber Co., Akron, Ohio. The letters *XX*. For bicycle and all kinds of vehicle tires.
63,854. The Diamond Rubber Co., Akron, Ohio. The number 400 and word *Tandem*. For bicycle and all kinds of vehicle tires.
63,855. The Diamond Rubber Co., Akron, Ohio. The number 1930. For bicycle and all kinds of vehicle tires.
63,856. The Diamond Rubber Co., Akron, Ohio. The word *Ixion*. For bicycle and all kinds of vehicle tires.
63,891. The Diamond Rubber Co., Akron, Ohio. The word *Python*. For rubber belting, valves, etc.
63,892. The Diamond Rubber Co., Akron, Ohio. The word *Unicorn*. For bicycle and all kinds of vehicle tires.
63,893. The Diamond Rubber Co., Akron, Ohio. The word *Clipper*. For rubber belting, valves, etc.
63,894. The Diamond Rubber Co., Akron, Ohio. The word *Defiance*. For rubber belting, valves, etc.

ISSUED NOVEMBER 12, 1912.

1,043,828. Vehicle-wheel. J. B. Hayden, San Angelo, Tex.
1,044,013. Hose-protector. R. W. Burnett, Montreal, Quebec, Canada.
1,044,015. Pneumatic insole and arch support. M. Byrne, San Francisco, Cal.
1,044,222. Rubber-heel. J. Mladezki and P. Wenk, Chicago, Ill.
1,044,260. Waterproof flower-stem protector. E. Schloss, New York.
1,044,294. Resilient top piece for the heels of boots and shoes. H. Thorne, Melbourne, Australia.
1,044,324. Adjustable elastic automobile-wheel. P. Wilkes, Cleveland, Ohio.
1,044,328. Detachable rim for vehicles. M. Wolff, Chelsea, England, assignor to Messrs. Michelin & Cie, Clermont-Ferrand, France.
1,044,352. Vehicle-tire. W. C. Cleghorn, Bloomington, Ill.
1,044,355. Shoe-dauber. J. R. Cygon, Annapolis, Md.

Trade Marks.

65,559. Near-Air Tire Co., St. Louis, Mo. The words *Near Air*. A compound filler for non-metallic tires.
66,208. Vulcanized Rubber Co., New York. The word *Senorita*. For rubber combs.
66,263. The Republic Rubber Co., Youngstown, Ohio. The letter *R* over an eagle and wreath design.

ISSUED NOVEMBER 19, 1912.

1,044,174. Vulcanizer. B. R. Barder, Akron, Ohio.
1,044,495. Hose-coupling. T. Clegg and G. Gee, Calgary, Alberta, Canada.
1,044,512. Cushion-tire. H. A. Fry and G. J. Bruce, Spring Lake, Wis.
1,044,522. Resilient wheel. A. Frederick, Hawksley, Fairhaven, England.
1,044,540. Rubber heel. F. W. Kremer, Carlstadt, N. J.
1,044,619. Resilient hub for vehicle-wheels. E. Yoder, Tulsa, Okla.
1,044,652. Buoyant wearing-apparel, cloth, and other article. K. Hartwig, assignor to Hartwig-Gesellschaft. m. b. H. Berlin, Germany.
1,044,703. Tire-protector. S. Stern, Albuquerque, N. Mexico.
1,044,737. Nipple. F. H. Bowly, New York.
1,044,779. Tire-signal. G. T. Hackley, Los Angeles, Cal.
1,044,888. Wheel-tire. F. Householder, Guthrie, Okla.
1,044,890. Elastic fabric. W. Kops, assignor to Kops Bros., New York.
1,044,947. Corset. E. Temple, London, England.
1,044,951. Resilient wheel. T. E. Van Der Werken, Green Island, New York.
1,044,977. Protective covering for hats and the like. H. Berlin and M. J. Fogarty, New York.
1,045,018. Demountable rim. E. L. Gold and J. H. Messinger, Nazareth, Pa.
1,045,042. Garment clasp. M. Krischer, New York.
1,045,053. Method of producing a rubber-containing product. A. E. Merritt, Gainesville, Ga.

Trade Mark.

65,693. Hood Rubber Co., Boston, Mass. The words *Country Club*. Rubber boots and shoes.

ISSUED NOVEMBER 26, 1912.

1,045,214. Sectional tire. B. C. Swinehart, Youngstown, Ohio.
1,045,346. Tire-making machine. T. J. Whalen, New Brunswick, N. J.
1,045,402. Pulsator for pneumatic milking. C. V. Henrichsen, Copenhagen, Denmark.
1,045,456. Nursing nipple. A. H. Tatum, assignor to Whitall Tatum Co., New York.
1,045,495. Tire-inflating pump. H. K. Austin, Reading, Mass.
1,045,543. Elastic tire for wheels. C. H. Genth, Philadelphia, Pa.
1,045,544. Wheel-tire. C. H. Genth, Philadelphia, Pa.
1,045,574. Rupture-truss. A. Loewy, Berlin, Germany.
1,045,601. Toy bottle. W. C. Parsells, Ellenville, N. Y.
1,045,661. Spring-wheel. J. Baird, Detroit, Mich.
1,045,760. Tire-inflator. W. A. Vinson, Heraldsburg, Cal.
1,045,762. Rubber mats. E. P. White, Chicago, Ill.

[NOTE.—Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1911.

**Denotes Patents for American Inventions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 6, 1912.]

16,490. Inflating rubber articles by diffusion. A. Staehler, 1 Hessische strasse, Berlin.
16,560. Molding tire covers. J. S. Stocks, Chapeltown, Leeds, and G. W. Bell Fulstone, Mile End Lane, Stockport.
16,570. Washing or wringing machines, etc. E. Bentley, 149 Beeches avenue, Bradford Road, Keighley, Yorkshire.
16,604. Wrapping fabrics round pneumatic tyres. Soc. A. Olier et Cie., Usines St. Remy, Clermont-Ferrand, Puy de Dome, France.
16,606. Working crude rubber. Soc. A. Olier et Cie., Usines St. Remy, Clermont-Ferrand, Puy de Dome, France.
16,803. Pneumatic tire-cover. A. J. Boult, 111 Hatton Garden, London.
16,812. Pneumatic cushion for tires. E. R. Riedinger, 84 Upper Kennington Lane, and A. Fraser, 6 Atherstone Terrace, Kensington—both in London, England.
16,855. Use of layers of india-rubber in boots. A. G. Knight, Wickham, Hampshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 13, 1912.]

16,949. Supports for rubber tires. O. H. Hinds, Le Mars, Iowa.
17,124. Extracting resin from rubber. W. Hiestrich (Nachfolger), 4 Jungfernstieg, Hamburg, Germany.
17,125. India-rubber. W. Hiestrich (Nachfolger), 4 Jungfernstieg, Hamburg, Germany.
17,182. Flexible tires. J. Souden, 10 Oswald Road, Edinburgh, Scotland.
17,261. Pneumatic cushion in tires. W. Woodland, 34a Melville Road, Walthamstow, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 20, 1912.]

*17,406. Caps for fountain pens. J. Blair, 6 John street, New York, U. S. A.
17,578. Tire attachments to rims. T. D. Staples, 1 Coronation Cottages, Exning Road, and C. Peck, Sefton Lodge—both in Newmarket.
17,582. Feeding-bottles. B. E. D. Kilburn, Chancery Lane Station Chambers, London.
17,624. Block tires. H. P. Haas, 112 Boulevard de la Senne, Brussels.
17,643. Tongue-cleaning appliances. M. Balaban, Barlow Moor Road, West Didsbury, Manchester.
17,689. Locating punctures in tires. B. G. Burchell, 10 Dalkeith Place, Kettering.
17,700. Wheel tires. D. Maggiora, 1 Albany street, Regent's Park, London.
17,726. Purifying india-rubber. M. Kochnitzky, 204 avenue Brugmann, and A. Friedl, 81 avenue du Midi—both in Brussels.

17,789. Moulding-process. L. Penkala, 7 Rue Condorcet, Courbevoie, Seine, France.

17,808. Wheel and mud guards. E. Newman, 1 Leonard street, City Road, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 27, 1912.]

17,888. Rubber seed shells in fuel composition. Williamsons, Ltd., Savage Gardens, and W. S. Curtis, 19 Lancaster Road, Ealing—both in London.

*17,956. Rubber casing in rectal appliances. T. Weaver and D. M. Ennis, 1529 Prospect avenue, and I. O. Crittenden, 8920 Wade Park avenue—both in Cleveland, Ohio., U. S. A.

17,992. Rubber hand stamps. A. H. Rogers, 22 Temple street, Springfield, Mass., U. S. A.

17,998. Winding wire, etc., on cores. W. Furstenberg, 54 rue Scheutveld, Anderlecht, near Brussels.

18,045. Springs for fastenings, straps, etc. M. Alberiz, 28 Muhlenbach, Cologne, Germany.

*18,079. Couch rolls in paper machinery. W. H. Millspaugh, Sandusky, Ohio, U. S. A.

18,075. Rubber cements. C. Jearsain, 5 bis, rue Sebastien Gyrphe, Lyons, France.

18,146. Pneumatic cushions for tires. T. H. Holroyd, 34 Morley Road, East Twickenham, Middlesex.

18,234. Vulcanizing solid tires to metal bands. J. Reuse and C. Reuse, Quai au Charbon, Hal, Belgium.

18,258. Rubber gymnasium shoes. North British Rubber Co., Castle Mills, Fountainbridge, and E. C. Clark, 156 Craiglea Drive—both in Edinburgh.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

442,704 (March 23, 1912). A. Thevenin. Leather protector against wear and bursting of pneumatic tires.

442,800 (April 23). G. Gerli. Tanned and parchmented leather cover for pneumatic tires.

442,862 (April 23). M. Giraud. Elastic vehicle tire.

442,878 (June 29, 1911). C. Morel. Elastic vehicle tire.

442,893 (April 29, 1912). W. W. Byam. Improvements in elastic tires and wheel rims.

442,974 (March 11). J. Gand. Demountable pneumatic tire in 3 parts, with non-wearing and non-bursting band.

442,980 (March 21). Ostromislensky and Bogatyr Rubber Manufacturing Co. Process for obtaining isoprene by means of dipentenes, their isomers and analogues.

442,981 (March 21). Ostromislensky and Bogatyr Rubber Manufacturing Co. Process for obtaining rubber by means of chloride and bromide of vinyl.

442,982 (March 21). Ostromislensky and Bogatyr Rubber Manufacturing Co. Process for obtaining rubber by means of isoprene and analogous bodies.

443,156 (April 30). J. M. Thevenet. Elastic vehicle tire.

443,180 (April 30). Olier & Co. Apparatus for vulcanizing covers of pneumatic tires.

443,222 (May 1). W. Mascord. Improvement in elastic tires.

442,991 (March 30). Ostromislensky and Bogatyr Rubber Manufacturing Co. Manufacture of rubber or analogous substances by means of halogene compositions and organic substances.

443,322 (May 2). Heinemann and Boehm. Manufacture of tires.

443,333 (April 26). "Tenax" Tire Co. Tires for heavy automobiles.

443,275 (July 10, 1911). A. Pinel. Manufacture of gum or mucilage from carob seeds.

443,338 (April 27, 1912). J. Giraud. Fixed double faced rubber heel.

443,511 (May 8). G. Chapelet. Protected pneumatic automobile tire.

443,546 (March 5). De Laski & Thropp Circular Woven Tire Co. Machine for manufacture of pneumatic tires.

[NOTE.—Printed copies of specifications of French patents can be obtained from R. Bobet, Ingenieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

254,371 (September 1, 1911). Farbenfabriken, vorm. F. Bayer & Co., Elberfeld. Process for production of substance resembling rubber.

253,517 (August 7, 1910). Process for manufacture of products resembling rubber. Dr. H. Noerdlinger, Flörsheim, Germany.

253,518 (August 7, 1910). Process for manufacture of elastic masses. Dr. H. Noerdlinger, Flörsheim, Germany.

253,519 (August 7, 1910). Process for manufacture of products resembling rubber. Dr. H. Noerdlinger, Flörsheim, Germany.

253,854 (November 13, 1910). Machine for washing crude rubber, etc. Crude Rubber Washing Co., London.

254,196 (January 12, 1911). Process for preservation and improvement of latex. Dr. G. Eichelbaum, Augsburger Strasse 8, Berlin.

THE KINGDOM OF BELGIUM.

PATENTS PUBLISHED.

249,236 (1912). Wenjacit G. m. b. H., Hamburg. Preparation of an elastic and plastic substance.

249,212 (1912). F. Frank and E. Marckwald, Berlin. Extraction of rubber from latex.

249,382 (1912). Diamond Rubber Co., Akron, U. S. A. Preparation of rubber and analogous substances.

249,774 (1912). J. Sterckx, rue Van Dyk 54, Brussels. Manufacture of special articles in ebonite or hard rubber.

A PLATFORM FOR HIGH-PRESSURE STREAMS.

It is often a very hazardous matter to hold the nozzle of a fire hose on an icy pavement, a slippery street, or a slanting roof. The illustration shows a small and conveniently handled device that makes it perfectly possible for a single person to manipulate the nozzle of a hose pipe no matter how uncertain the footing or how high the pressure. It is a small oblong platform which can be folded up, and when folded is only about 20 inches long and 10 inches high; it weighs only 20 pounds. This can be opened and put down on a slanting roof or an icy

THE EASTMAN PLATFORM FOR HIGH-PRESSURE STREAMS.

pavement, and nothing can budge it, because there are several sharp prongs on the lower side that take hold and keep hold. The upper surface of this platform is covered with rubber to protect the firemen from electric shocks from streams that strike highly charged wires. Near the center of the platform there is a socket which holds the extension rod of the "Perfection" holders, also made by the Eastman Company. The accompanying cut shows the Eastman platform in conjunction with one of the Eastman Perfection holders. By the use of this combined platform and holder, the stream can be directed at any angle and under all possible pressures. A great many city fire departments are equipped with these Eastman outfits, the Baltimore Fire Department having recently adopted this system for its million-dollar high-pressure service. (The Samuel Eastman Co., Concord, N. H.)

FINE IF IT ONLY WORKS.

From time to time the general consumer is cheered by a paragraph—that turns up once in so often in the columns of the newspapers—telling him how rubber articles that have lost their elasticity can be brought back to their original estate. The advice usually reads something like this paragraph, taken from a recent number of a western paper:

"People using articles made of rubber that frequently lose their elasticity through oxidation may restore the material to its original condition by a simple process. Soak the article in a mixture of one part of ammonia to two parts water. This is particularly well adapted to the restoring of rubber bands, rings and small tubing which are ready to become dry and brittle."

Soaking rubber goods in a mixture of ammonia and water is simple and easy, but, unfortunately, there is one drawback—it doesn't work. The only way to remedy a rubber band that has turned hard and brittle is to get a new band.

Review of the Crude Rubber Market.

ON November 25, at date of last report, the price of fine Pará in London was 4s. 5d. During the later days of the month it improved, reaching 4s. 6¼d. on November 30. A further improvement brought it by December 10, to 4s. 8¼d., the highest price reached during the month, from which point it fell during the ensuing week to 4s. 6d. Another rise commencing on the 18th brought the price by the 24th, just before the holiday, to 4s. 7¾d. The month's fluctuations, therefore, resulted in an advance of 2¾d.; restoring figure to about where it had stood three months earlier.

In plantation rubber there was during the month a closer approximation of value to that of fine Pará. On November 25, they stood respectively at 4s. 5d. and 4s. 3¾d., since which time the difference thus shown was in some cases increased by the course of plantation rubber. The latest quotations, of December 24, are: Pará, 4s. 7¾d.; plantation, 4s. 7¼d. (only ½d. difference). Compared with the position on October 26, of 4s. 6d. and 4s. 2½d., the interval of two months has resulted in an advance of 1¾d. in the former, and of 4¾d. in the latter.

The relative quietness of demand in the London market throughout the month, was accompanied by absence of any pressure by sellers. Consumers have not been desirous of anticipating their wants. In some quarters it is thought that there is a considerable short account in existence, but this consideration has not exercised much influence upon the action of buyers. Meanwhile the increased American consumption has strengthened the market. Anticipations have been expressed of consumers entering the market more freely after the turn of the year, in order to replenish their stocks.

Auctions took place in London on December 3 and 17; the former comprising about 800 tons. The quantity would have been larger but for the withholding of crêpe descriptions, arrived in execution of contracts. The anticipations of firmness proved correct, the rates averaging one penny above the previous fortnightly sale; thus reflecting the course of the open market. One of the features of the auction was the attaining of the price of 5s. per pound for Highland smoked sheets. Cable reports of the sale of December 17 indicate a slight decline on the rates of the previous auction of December 3. Offerings were 922 tons.

At the Antwerp sale of December 13, out of 392 tons Congo, 359 were sold at an advance of about 6 per cent. on valuations. Of 118 tons plantation, practically the whole was sold at a similar increase.

The Rotterdam sale of December 10, included 60 tons Congo and 6 tons *Hevea*. An advance representing on an average 5 per cent. over valuations was obtained.

At Amsterdam, on December 11, there were offered 56 tons, chiefly *Hevea* and *Ficus*, of which about 40 tons were sold at 4 per cent. above valuations.

NEW YORK QUOTATIONS.

FOLLOWING are the quotations at New York for Parà grades, one year ago, one month ago, December 30—the current dates:

PARA	Jan. 1, '12.	Dec. 1, '12	Dec. 30, '12
Islands, fine, new	96@ 97	95@ 96	102@103
Islands, fine, old	98@ 99	.....	.....
Upriver, fine, new	104@105	106@107	111@112
Upriver, fine, old	108@109	113@114	118@119
Islands, coarse, new	62@ 63	54@ 55	56@ 57
Islands, coarse, old	.....	.....	.....
Upriver, coarse, new	89@ 90	82@ 83	82@ 83
Upriver, coarse, old	.....	.....	.....
Cametà	63@ 64	55@ 56	57@ 58
Caucho (Peruvian) ball	88@ 89	81@ 82	84@ 85
Caucho (Peruvian) sheet	.....	.....	.....
PLANTATION CEYLONS.			
Fine smoked sheet	115@116	111@112	112@113
Fine pale crepe	119@120	106@107	110@111
Fine sheets and biscuits	115@116	105@106	109@110
CENTRALS.			
Esmeralda, sausage	86@ 87	78@ 79	81@ 82
Guayaquil, strip	.....	.....	.....
Nicaragua, scrap	83@ 84	77@ 78	80@ 81
Panama	.....	.....	.....
Mexican plantation, sheet	.....	.....	.....
Mexican, scrap	84@ 85	76@ 77	79@ 80
Mexican, slab	53@ 54	.....	.....
Managabeira, sheet	62@ 63	.....	.....
Guayule	53@ 54	58@ 59	60@ 61
Balata, sheet	81@ 82	82@ 83	.....
Balata, block	53@ 54	54@ 55	.....
AFRICAN.			
Lopori, ball, prime	101@102	98@ 99	.....
Lopori, strip, prime	.....	.....	.....
Aruwimi	100@101	87@ 88	98@ 99
Upper Congo, ball, red	.....	97@ 98	101@102
Sierra Leone, 1st quality	89@ 90	95@ 96	96@ 97
Massai, red	90@ 91	98@100	99@100
Soudan, Niggers	.....	.....	.....
Cameroon, ball	62@ 63	.....	.....
Benguela	64@ 65	73@ 74	74@ 75
Madagascar, pinky	.....	.....	.....
Accra, flake	26@ 27	25@ 26	26@ 27
EAST INDIAN.			
Assam	.....	.....	.....
Pontianak	.....	6¼@ 7	6⅞@
Borneo	.....	.....	.....

Late Pará cables quote:

Per Kilo.		Per Kilo.
Islands, fine	Upriver, fine	5$650
Islands, coarse	Upriver, coarse	3$900
	Exchange	16 11/32d.

Latest Manáos advices:

Upriver, fine	5$900	Exchange	16 11/32d.
Upriver, coarse	3$700		

African Rubbers.

NEW YORK STOCKS (IN TONS).

November 1, 1911	45	June 1, 1912	94
December 1	60	July 1	62
January 1, 1912	58	August 1	85
February 1	150	September 1	156
March 1	90	October 1	89
April 1	80	November 1	90
May 1	62	December 1	80

New York.

IN REGARD to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "The demand for paper during December has been very light, city banks buying almost nothing and out-of-town ones but little. Rates have ruled at 6@6½ per cent. for the best rubber names, and 6½@7 per cent. for others. We look for an improvement in demand and lower rates in January."

NEW YORK PRICES FOR NOVEMBER (NEW RUBBER).

	1912.	1911.	1910.
Upriver, fine	$1.02@1.08	$0.99@1.06	$1.36@1.52
Upriver, coarse	.80@ .84	.87@ .91	1.02@1.07
Islands, fine	.94@1.00	.93@1.00	1.20@1.28
Islands, coarse	.53@ .58	.57@ .60	.73@ .75
Cameta	.55@ .58	.60@ .62	.75@ .78

Statistics of Para Rubber (Excluding Caucho).

	NEW YORK. Fine and Medium.	Coarse.	Total, 1912.	Total, 1911.	Total, 1910.
Stocks, October 31..*tons*	144	17 =	161	352	211
Arrivals, November.....	1,151	480 =	1,631	1,883	1,432
Aggregating	1,295	497 =	1,792	2,235	1,643
Deliveries, November....	1,143	473 =	1,616	1,877	1,487
Stocks, November 30..	152	24 =	176	358	156

	Para. 1912.	Para. 1911.	Para. 1910.	England. 1912.	England. 1911.	England. 1910.
Stocks, Nov. 30...*tons*	1,845	3,475	875	240	750	1,120
Arrivals, November...	3,000	3,240	3,550	1,073	1,146	1,098
Aggregating	4,845	6,715	4,425	1,313	1,896	2,218
Deliveries, November.	3,580	3,665	3,235	1,053	961	883
Stocks, November 30	1,265	3,050	1,190	260	935	1,335

	1912.	1911.	1910.
World's visible supply, November 30....*tons*	3,284	5,529	4,591
Pará receipts, July 1 to November 30.....	11,455	11,190	11,085
Pará receipts of caucho, same dates.....	2,030	1,400	2,090
Afloat from Pará to United States, Nov. 30..	338	256	420
Afloat from Pará to Europe, November 30...	1,245	930	1,490

WEEKLY MOVEMENT OF LONDON PRICES.

[IN SHILLINGS AND PENCE PER POUND.]

May 3, 1912.....	4/7½	August 30, 1912.....	5/1¾
May 10	4/7½	September 6	4/11½
May 17	4/7½	September 13	4/9½
May 24	4/7½	September 20	4/8
May 31	4/7½	September 27	4/7
June 7	4/8½	October 4	4/7
June 14	4/10	October 11	4/7
June 21	4/9½	October 18	4/6½
June 28	4/7½	October 25	4/6
July 5	4/9	November 1	4/4½
July 12	4/10	November 8	4/5
July 19	4/10	November 15	4/5¼
July 26	4/11¾	November 22	4/5¼
August 2	4/11	November 29	4/5½
August 9	5/0½	December 6	4/7
August 16	5/0½	December 13	4/7
August 23	5/2	December 20	4/6½

Liverpool.

WILLIAM WRIGHT & Co. report December 2, 1912:

Fine Pará.—In the early part of the month there was a sharp decline of *2d.* to *3d.* per pound. Since then prices advanced to the former level. The market closes with a distinctly steady undertone. Closing values: hard fine, *4s. 6d.* [$1.10]; soft fine, *4s. 1½d.* [$1]. Trade demand on the whole continues good, which, we think, is evidenced by stock returns, which, in spite of an increase in supplies, are 263 tons, against 929 tons in November, 1911, and 1,337 tons in 1910. America still continues buying a fair proportion on this market, in addition to direct purchases in Brazil; further parcels are now in course of shipment, which do not appear in this month's statistics. The outlook at present is for steady prices, with moderate fluctuations. Receipts for the month are 3,760 tons, including 500 tons Caucho, against 3,920 tons last month, and 3,540 tons last year, totaling 14,140 tons against 12,180 tons last season.

Rubber Stock at Para.

On May 31 the stock had increased, but had receded by June 30; and had again fallen off on July 31. Large sales by the syndicate materially reduced the stock by the end of August, from which point it had slightly increased by September 30. A further increase was shown on October 31. The stock had dropped by November 30 to the lowest point reached in 1911 or 1912.

April 30, 1911.....*tons*	5,104	February 29, 1912...*tons*	3,240
May 31	5,350	March 31	2,730
June 30.....	4,545	April 30	2,770
July 31	3,884	May 31	2,995
August 31	3,450	June 30	2,685
September 30	3,102	July 31	2,300
October 31.....	3,320	August 31	1,355
November 30	3,050	September 30	1,420
December 31	2,675	October 31	1,845
January 31, 1912.....	3,370	November 30	1,265

IMPORTS FROM PARA AT NEW YORK.

[*The Figures Indicate Weight in Pounds.*]

NOVEMBER 25.—By the *Christopher*, Manáos and Pará:

	Fine.	Medium.	Coarse.	Coucho.	Total.
Arnold & Zeiss.....	426,400	37,800	128,900	54,200=	647,300
Henderson & Korn.....	75,300	6,800	62,100	104,600=	248,800
General Rubber Co.....	71,400	13,200	32,000	.....=	116,600
Meyer & Brown.....	41,600	4,100	32,700	8,500=	86,900
Robinson & Co.....	60,800	5,500	14,900	.....=	81,200
New York Commercial Co...	47,300	5,000	23,000	3,900=	79,200
De Lagotellerie & Co.....	34,000	4,600	25,100	3,900=	67,600
Edward Maurer	8,800	900	800	.....=	10,500
Total	765,600	77,900	319,500	175,100=	1,338,100

DECEMBER 4.—By the *Aidan*, Manáos and Pará:

	Fine.	Medium.	Coarse.	Coucho.	Total.
Arnold & Zeiss.....	132,300	73,900	142,800	37,700=	386,700
Henderson & Korn.....	18,800	5,700	27,400	124,200=	176,100
General Rubber Co.....	79,000	13,400	22,800	.....=	115,200
New York Commercial Co..	54,000	10,400	14,100	3,100=	81,600
Meyer & Brown.....	25,500	.....	4,100	51,800=	81,400
Edward Maurer	9,600	300	3,300	19,900=	33,100
H. A. Astlett Co.....	23,500	1,100	5,900	.....=	30,500
L. Johnson & Co.....	.....	.....	.....	27,800=	27,800
Robinson & Co.....	.....	.....	17,900	300=	18,200
De Lagotellerie & Co.....	.....	.....	14,500	.....=	14,500
Hagemeyer & Brown.....	4,700	1,800	.....	.....=	6,500
Total	347,400	106,600	252,800	264,800=	971,600

DECEMBER 11.—By the *Napo*, Iquitos.

	Fine.	Medium.	Coarse.	Coucho.	Total.
H. A. Astlett Co.....	33,100	.....	5,600	9,500=	48,200
W. R. Grace & Co.....	4,400	.....	1,400	5,000=	10,800
Manuel Ayala	1,500	.....	.....	2,300=	3,800
Total	39,000	.....	7,000	16,800=	62,800

PARA RUBBER VIA EUROPE.

NOVEMBER 26.—By the *Kroonland*=Antwerp:

	Pounds.
Ed. Maurer (Fine)	9,000

NOVEMBER 29.—By the *President Grant*=Hamburg:

Ed. Maurer (Fine).....	45,000	
N. Y. Commercial Co. (Fine)...	22,500	
Wallace L. Gough Co. (Fine)..	7,000	
Ed. Maurer (Caucho).....	7,000	81,500

NOVEMBER 30.—By the *Niagara*=Havre:

Raw Products Co. (Coarse)....	3,500	
Arnold & Zeiss (Caucho).....	34,000	37,500

DECEMBER 2.—By the *Carmania*=Liverpool:

Arnold & Zeiss (Fine).....	27,000	
N. Y. Commercial Co. (Fine)..	22,500	
Robinson & Co. (Fine).....	8,000	57,500

DECEMBER 3.—By the *Tivives*=Mollendo:

N. Y. Commercial Co. (Fine)...	3,500	
N. Y. Commercial Co. (Coarse)	2,500	6,000

DECEMBER 3.—By the *Victoria*=Hamburg:

Wallace L. Gough Co. (Fine)..	7,000	
N. Y. Commercial Co. (Fine)..	4,500	
Arnold & Zeiss (Fine).....	3,500	15,000

DECEMBER 9.—By the *Caronia*=Liverpool:

N. Y. Commercial Co. (Fine)...	275,000	
Ed. Maurer (Fine).....	22,500	
Arnold & Zeiss (Fine).....	15,000	
Raw Products Co. (Fine).....	8,000	
N. Y. Commercial Co. (Caucho).	34,000	354,500

DECEMBER 16.—By the *Baltic*=Liverpool:

N. Y. Commercial Co. (Coarse).	9,000	
Raw Products Co. (Fine).....	9,000	18,000

DECEMBER 16.—By the *Pennsylvania*=Hamburg:

Ed. Maurer (Fine).....	40,000	
Rubber Trading Co. (Fine)....	11,500	
Wallace L. Gough Co. (Fine)..	11,000	
N. Y. Commercial Co. (Fine)...	5,000	67,500

DECEMBER 21.—By the *Megantic*=Liverpool:

N. Y. Commercial Co. (Fine)...	95,000	
N. Y. Commercial Co. (Caucho).	26,000	
Arnold & Zeiss (Fine).....	15,000	
Raw Products Co. (Fine).....	15,000	151,000

OTHER NEW YORK ARRIVALS.

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

NOVEMBER 26.—By the *Louisiana*=Havre:

	Pounds.
Henderson & Korn.....	20,000

NOVEMBER 26.—By the *Frutera*=Honduras:

A. Rosenthal & Sons.....	7,000	
G. Amsinck & Co.....	2,000	
R. G. Barthold.....	1,000	10,000

NOVEMBER 27.—By the *Allianca*=Colon:

G. Amsinck & Co.....	15,000	
L. Johnson & Co.....	9,000	
W. R. Grace & Co.....	5,000	
Wessels, Kulenkampff & Co.....	5,000	
J. Sambrada & Co.....	2,500	
Chas. E. Griffin.....	2,500	
Roldau & Van Sickle.....	1,500	40,500

NOVEMBER 28.—By the *Monsanillo*=Tampico:

Continental Mexican Co.....	*89,000	
Arnold & Zeiss.....	*22,500	
American Trading Co.....	*5,500	
For Europe	*70,000	*187,000

NOVEMBER 29.—By the *Morro Castle*=Vera Cruz:

Chas. T. Wilson.....	2,500	
J. W. Wilson & Co.....	1,500	4,000

NOVEMBER 29.—By the *President Grant*=Hamburg:

Rubber Trading Co.....	11,500	
Arnold & Zeiss.....	11,900	22,500

NOVEMBER 30.—By the *Niagara*=Havre:

In transit		15,000

DECEMBER 2.—By *El Occidente*=Galveston:

Chas. T. Wilson	*7,000	
For Europe	*55,000	*62.000

DECEMBER 2.—By the *Carmania*=Liverpool:

Geo. A. Alden & Co.	11,500	
Arnold & Zeiss	11,000	22,500

DECEMBER 3.—By the *Victoria*=Hamburg:

Arnold & Zeiss	105,000	
Ed. Maurer	30,000	135,000

DECEMBER 3.—By the *Allemannia*=Colombia:

Caballero & Blanco	4,500	
Kunhardt & Co.	3,500	
Winter & Smillie	3,500	
I. Brandon & Bros.	1,500	13,000

DECEMBER 4.—By the *Colon*=Colon:

G. Amsinck & Co.	11,500	
Piza, Nephews & Co.	2,500	
Wessels, Kulenkampff & Co.	2,500	
Mecke & Co.	2,000	
Pablo Calvet & Co.	1,500	
Heilbron, Wolff & Co.	1,500	21,500

DECEMBER 4.—By the *Momus*=New Orleans:

Manhattan Rubber Mfg. Co.	4,500	
Eggers & Heinlein	2,500	
Wessels, Kulenkampff & Co.	2,000	
A. N. Rotholz	1,500	10,500

DECEMBER 4.—By the *Magdelena*=Colombia:

G. Amsinck & Co.	7,000	
Mecke & Co.	5,500	
J. Sambrada & Co.	3,500	
A. M. Capen's Sons	3,000	
R. Del Castillo & Co.	2,500	
Chas. E. Griffin	1,500	23,000

DECEMBER 5.—By the *Segurance*=Tampico:

For Europe		*67,000

DECEMBER 6.—By the *Voltaire*=Bahia:

A. Hirsch & Co.	9,000	
J. H. Rossbach & Bros.	5,000	14,000

DECEMBER 7.—By *El Norte*=Galveston:

Continental-Mexican Co.	*79,000	
Chas. T. Wilson	*22,500	*101,500

DECEMBER 9.—By the *Caronia*=Liverpool:

Arnold & Zeiss		15,000

DECEMBER 9.—By the *Esperanza*=Vera Cruz:

Harburger & Stack	2,500	
Geo. A. Alden & Co.	2,500	
H. Marquardt & Co.	2,500	
Graham, Hinkley & Co.	2,000	
General Export Commission Co.	2,000	
J. W. Wilson & Co.	1,500	
E. Steiger & Co.	1,000	
W. L. Wadleigh	1,000	
Mecke & Co.	1,000	16,000

DECEMBER 9.—By the *Westerwald*=Colombia:

Caballero & Blanco	2,500	
A. Helde	2,000	4,500

DECEMBER 10.—By the *Advance*=Colon:

G. Amsinck & Co.	12,000	
Roldau & Van Sickle	3,000	
Schutte, Bunemann & Co.	2,500	17,500

DECEMBER 11.—By the *Chicago*=Havre:

In transit		45,000

DECEMBER 11.—By the *Prinz Joachem*=Colon:

G. Amsinck & Co.	8,500	
I. Brandon & Bros.	3,000	
Andean Trading Co.	2,000	
P. V. Rubie & Co.	2,000	
Suzarte & Whitney	1,500	17,000

DECEMBER 13.—By *El Alba*=Galveston:

Chas. T. Wilson		*40,000

DECEMBER 13.—By the *Mexico*=Frontera:

W. L. Wadleigh	5,500	
Meyer & Brown	2,500	
Willard, Hawes & Co.	2,500	
G. Amsinck & Co.	1,500	
German-American Coffee Co.	1,500	
Lawrence Import Co.	1,500	
H. Marquardt & Co.	1,500	
E. Steiger & Co.	1,000	17,500

DECEMBER 14.—By the *Antilla*=Tampico:

Continental-Mexican Co.	*225,000	
N. Y. Commercial Co.	*70,000	
Arnold & Zeiss	*55,000	*350,000

DECEMBER 16.—By the *Baltic*=Liverpool:

Henderson & Korn		30,000

DECEMBER 16.—By the *Panama*=Colon:

G. Amsinck & Co.	2,000	
Meyer & Hecht	1,500	
Colombian Smelting Co.	1,000	
Gillespie Bros. & Co.	1,000	
Pablo. Calvet & Co.	1,000	6,500

DECEMBER 16.—By the *Albingia*=Colombia:

Maitland, Coppell & Co.	2,500	
Kunhardt & Co.	2,000	
Mecke & Co.	1,500	
Winter & Smillie	1,000	7,000

DECEMBER 16.—By the *Pennsylvania*=Hamburg:

Meyer & Brown	11,500	
Ed. Maurer	8,000	19,500

DECEMBER 19.—By the *Mesaba*=London:

General Rubber Co.		45,000

DECEMBER 19.—By the *Tagus*=Colon:

L. Johnson & Co.	6,500	
A. M. Capen's Sons	4,500	
Gould & Co.	3,000	
Mecke & Co.	2,500	
J. Sambrada & Co.	2,500	
Kunhardt & Co.	1,500	
I. Brandon & Bros.	1,000	
In transit	8,000	29,500

DECEMBER 19.—By the *Matanzas*=Tampico:

Continental-Mexican Co.	*180,000	
Arnold & Zeiss	*22,500	
Chas. T. Wilson	*10,000	*212,500

DECEMBER 19.—By the *Delgorgio*=Colombia:

A. Helde	7,000	
Pottsberg Ebling Co.	2,500	
G. Amsinck & Co.	2,000	
DeLima Cortissoz Co.	1,000	12,500

DECEMBER 21.—By the *Megantic*=Liverpool:

Henderson & Korn		11,000

DECEMBER 23.—By the *Allianca*=Colon:

G. Amsinck & Co.	2,000	
Wessels, Kulenkampff & Co.	2,000	4,000

DECEMBER 23.—By *El Occidente*=Galveston:

Continental-Mexican Co.	*65,000	
Ed. Maurer	*30,000	
Chas. T. Wilson	*7,000	*102,000

DECEMBER 23.—By the *Monterey*=Vera Cruz:

Chas. T. Wilson	11,000	
Ed. Maurer	3,500	
Geo. A. Alden & Co.	1,000	15,500

AFRICAN.

POUNDS.

NOVEMBER 26.—By the *Kroonland*=Antwerp:

Arnold & Zeiss	38,000	
N. Y. Commercial Co.	27,000	
Robinson & Co.	20,000	
Henderson & Korn	13,500	98,000

NOVEMBER 26.—By the *Germania*=Lisbon:

Santos & Segurra	22,500	
Wallace L. Gough Co.	5,500	28,000

NOVEMBER 29.—By the *President Grant*=Hamburg:

Ed. Maurer	50,000	
Arnold & Zeiss	20,000	
Wallace L. Gough Co.	27,000	
Geo. A. Alden & Co.	11,500	
Raw Products Co.	5,500	114,000

NOVEMBER 30.—By the *Niagara*=Havre:

Meyer & Brown	150,000	
Arnold & Zeiss	34,000	184,000

NOVEMBER 30.—By the *Celtic*=Liverpool:

James T. Johnstone		7,000

DECEMBER 2.—By the *New York*=London:

Arnold & Zeiss	7,000	
Meyer & Brown	3,500	10,500

DECEMBER 2.—By the *Carmania*=Liverpool:

Henderson & Korn	45,000	
Geo. A. Alden & Co.	9,000	
Arnold & Zeiss	4,500	58,500

DECEMBER 2.—By the *Victoria*=Hamburg:

Ed. Maurer	30,000	
Wallace L. Gough Co.	3,500	
Raw Products Co.	3,500	37,000

DECEMBER 4.—By the *Zeeland*=Antwerp:

Geo. A. Alden & Co.	85,000	
Meyer & Brown	80,000	
Robert Badenhop	11,500	
Ed. Maurer	11,000	187,500

DECEMBER 9.—By the *St. Paul*=London:

Geo. A. Alden & Co.	9,000	
In transit	7,000	16,000

DECEMBER 9.—By the *Caronia*=Liverpool:

Henderson & Korn	34,000	
James T. Johnstone	9,000	
Geo. A. Alden & Co.	2,000	45,000

DECEMBER 12.—By the *Chicago*=Havre:

Meyer & Brown	80,000	
Ed. Maurer	30,000	
Arnold & Zeiss	4,500	114,500

DECEMBER 12.—By the *Finland*=Antwerp:

Meyer & Brown	20,000	
Rubber Trading Co.	9,000	
Arnold & Zeiss	7,000	
Charles T. Wilson	2,000	38,000

DECEMBER 12.—By the *Oceanic*=London:

Charles T. Wilson	9,000	
Arnold & Zeiss	4,500	14,500

DECEMBER 16.—By the *Baltic*=Liverpool:

Arnold & Zeiss		7,000

DECEMBER 16.—By the *Pennsylvania*=Hamburg:

Meyer & Brown	25,000	
Ed. Maurer	40,000	
Geo. A. Alden & Co.	13,500	
Wallace L. Gough Co.	11,500	
General Rubber Co.	7,000	
Arnold & Zeiss	4,000	
Robert Badenhop	3,500	104,500

DECEMBER 19.—By the *Vaderland*=Antwerp:

Meyer & Brown		22,500

DECEMBER 21.—By the *Platia*=Lisbon:

Santos & Segurra	15,500	
Geo. A. Alden & Co.	15,000	
Ed. Maurer	11,500	42,000

EAST INDIAN.

[*Denotes plantation rubber.]

POUNDS.

NOVEMBER 26.—By the *Minnehaha*=London:

New York Commercial Co.	*112,000	
J. T. Johnstone	*70,000	
Ed. Maurer	*35,000	
Meyer & Brown	*45,000	
Arnold & Zeiss	*22,500	
R. Badenhop	*11,500	
Henderson & Korn	*11,000	
Charles T. Wilson	*4,500	
L. Blitz	*4,500	*316,000

NOVEMBER 26.—By the *Kroonland*=Antwerp:

Meyer & Brown		*125,000

NOVEMBER 29.—By the *St. Louis*=London:

Henderson & Korn	*35,000	
Ed. Maurer	*15,000	
Arnold & Zeiss	*11,500	
R. Badenhop	*7,000	
In transit	*75,000	
New York Commercial Co.	*10,000	*153,500

DECEMBER 2.—By the *Minnewaska*=London:

General Rubber Co.	*280,000	
J. T. Johnstone	*30,000	
Meyer & Brown	*30,000	
W. L. Gough Co.	*11,000	
General Rubber Co.	30,000	381,000

DECEMBER 2.—By the *Schonfels*=Colombo:

Meyer & Brown	*65,000	
New York Commercial Co.	*50,000	
Ed. Maurer	*11,500	
L. Littlejohn & Co.	*4,500	*131,000

DECEMBER 2.—By the *New York*=London:

New York Commercial Co.	*40,000	
Meyer & Brown	*25,000	
W. L. Gough Co.	11,500	*76,500

DECEMBER 4.—By the *Zeeland*=Antwerp:

Meyer & Brown		*65,000

DECEMBER 5.—By the *Reichenfels*=Colombo:

Meyer & Brown	*45,000	
New York Commercial Co.	*22,500	
L. Littlejohn & Co.	*11,500	*79,000

DECEMBER 5.—By the *Indrasamha*=Singapore:

Ed. Maurer	*100,000	
L. Littlejohn Co.	*35,000	
General Rubber Co.	*25,000	
W. L. Gough Co.	*15,000	
Otto Isenstein Co.	*7,000	
Malaysian Rubber Co.	25,000	
Ed. Maurer	5,500	
Arnold & Zeiss	5,000	217,500

DECEMBER 6.—By the *Majestic*=London:

Arnold & Zeiss	*50,000	
Charles T. Wilson	*30,000	
Ed. Maurer	*25,000	
R. Badenhop	*16,000	
Rubber Trading Co.	*7,000	*128,000

DECEMBER 9.—By the *St. Paul*=London:

New York Commercial Co.	*35,000	
Robinson & Co.	*11,500	
Meyer & Brown	*11,000	
Henderson & Korn	*11,500	
In transit	*22,500	*91,500

DECEMBER 9.—By the *Caronia*=Liverpool:

Ed. Maurer		*11,000

DECEMBER 9.—By the *Minnetonka*=London:

New York Commercial Co.	*135,000	
J. T. Johnstone	*80,000	
Meyer & Brown	*75,000	
Ed. Maurer	*60,000	
Arnold & Zeiss	*56,000	
L. Blitz	*22,500	
Raw Products Co.	*22,500	*451,000

DECEMBER 9.—By the *Kasemba*=Colombo:

New York Commercial Co.	*125,000	
Meyer & Brown	*90,000	
Ed. Maurer	*25,000	
L. Littlejohn & Co.	*20,000	*260,000

DECEMBER 12.—By the *Finland*=Antwerp:

Meyer & Brown		*50,000

DECEMBER 12.—By the *Oceanic*=London:

Meyer & Brown	*45,000	
Arnold & Zeiss	*25,000	
Ed. Maurer	*40,000	
Henderson & Korn	*22,500	
Charles T. Wilson	*10,000	
In transit	*70,000	*212,500

DECEMBER 19.—By the *Vaderland*=Antwerp:

Meyer & Brown		*125,000

DECEMBER 19.—By the *Mesaba*=London:

General Rubber Co.	*135,000	
J. T. Johnstone	*55,000	
New York Commercial Co.	*18,000	
L. Blitz	*11,000	
Ed. Maurer	*8,000	
Rubber Trading Co.	*9,000	
Charles T. Wilson	*2,500	
R. Badenhop	*2,500	
W. L. Gough Co.	*9,000	
General Rubber Co.	20,000	270,000
Arnold & Zeiss	9,000	279,000

DECEMBER 20.—By the *Philadelphia*=London:

New York Commercial Co.	*120,000	
Henderson & Korn	*34,000	
Arnold & Zeiss	*33,000	
Robinson & Co.	*25,000	*212,000

DECEMBER 21.—By the *Indrani*=Singapore:

Ed. Maurer	*15,000	
L. Littlejohn & Co.	*9,000	
W. L. Gough Co.	*9,000	
Otto Isenstein Co.	*5,000	
General Rubber Co.	*2,500	
Malaysian Rubber Co.	11,000	
Ed. Maurer	22,500	
Haebler & Co.	5,500	
Arnold & Zeiss	4,500	84,000

BALATA.

		Pounds.
NOVEMBER 27.—By the *Suriname*=Demerara:		
Ed. Maurer	11,000	
Middleton & Co.	3,500	
American Trading Co.	3,500	
Schutte, Bunemann & Co.	4,000	
George A. Alden & Co.	2,000	
Yglesias Lobo & Co.	2,500	26,500

DECEMBER 3.—By the *Marowijne*=Trinidad:

Schutte, Bunemann & Co.	15,000	
Yglesias Lobo & Co.	11,000	
American Trading Co.	11,000	
G. Amsinck & Co.	6,500	43,500

DECEMBER 9.—By the *Guiana*=Demerara:

Ed. Maurer		25,000

DECEMBER 16.—By the *Navarre*=Trinidad:

Ed. Maurer	22,500	
American Trading Co.	13,500	
Yglesias Lobo & Co.	10,000	
Middleton & Co.	3,500	
George A. Alden & Co.	1,500	51,000

DECEMBER 19.—By the *Mesaba*=London:

Wallace L. Gough Co.		11,500

DECEMBER 21.—By the *Grenada*=Trinidad:

Schutte, Bunemann & Co.	11,000	
Yglesias Lobo & Co.	7,000	18,000

GUTTA-JELUTONG.

		Pounds.
DECEMBER 3.—By the *Victoria*=Hamburg:		
George A. Alden & Co.		55,000
DECEMBER 5.—By the *Indrasamha*=Singapore:		
Wallace L. Gough Co.	300,000	
L. Littlejohn & Co.	550,000	
Haebler & Co.	125,000	
George A. Alden & Co.	110,000	1,085,000
DECEMBER 21.—By the *Indrani*=Singapore:		
L. Littlejohn & Co.	250,000	
Haebler & Co.	200,000	
Wallace L. Gough Co.	125,000	
George A. Alden & Co.	50,000	625,000

GUTTA-PERCHA.

		Pounds.
DECEMBER 5.—By the *Indrasamha*=Singapore:		
L. Littlejohn & Co.		45,000
DECEMBER 21.—By the *Indrani*=Singapore:		
L. Littlejohn & Co.	65,000	
Haebler & Co.	22,500	
Arnold & Zeiss	5,000	92,500

BOSTON ARRIVALS.

		Pounds.
NOVEMBER 1.—By the *Michigan*=Liverpool:		
Geo. A. Alden & Co. (Africans)		14,000
NOVEMBER 2.—By the *Winifredian*=Liverpool:		
Geo. A. Alden & Co. (Africans)		3,500
NOVEMBER 4.—By the *Devonian*=Liverpool:		
Geo. A. Alden & Co. (Africans)		5,000
NOVEMBER 15.—By the *Sachem*=Liverpool:		
Arnold & Zeiss (Africans)		11,500
NOVEMBER 15.—By the *Canadian*=Liverpool:		
Geo. A. Alden & Co. (Africans)		11,000
NOVEMBER 15.—By the *Iverclyde*=Singapore:		
State Rubber Co. (East Indian)		60,000
NOVEMBER 16.—By the *Anglian*=London:		
Geo. A. Alden & Co. (Africans)		2,000
NOVEMBER 16.—By the *Iverclyde*=Singapore:		
State Rubber Co. (Jelutong)	160,000	
Wallace L. Gough Co. (Jelutong)	150,000	
L. Littlejohn & Co. (Jelutong)	600,000	910,000
NOVEMBER 27.—By the *Bosnia*=Hamburg:		
Geo. A. Alden & Co. (Africans)	4,000	
Wallace L. Gough Co. (Africans)	10,000	14,000
NOVEMBER 27.—By the *Sagamore*=Liverpool:		
Geo. A. Alden & Co. (Africans)		29,000
NOVEMBER 29.—By the *Indrasamha*=Singapore:		
L. Littlejohn & Co. (Gutta percha)	34,000	
L. Littlejohn & Co. (Jelutong)	320,000	354,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK, NOVEMBER, 1912.

	Pounds.	Value.
Imports—		
India-rubber	9,531,733	$7,847,688
Balata	80,753	40,949
Guayule	779,676	312,129
Gutta-percha	54,670	38,750
Gutta-jelutong (Pontianak)	1,799,082	80,269
Total	12,245,914	$8,319,785
Exports—		
India-rubber	81,265	$70,136
Balata	20,082	14,020
Guayule	4,498	3,599
Gutta-percha	.....	.....
Reclaimed rubber	85,634	15,992
Gutta-jelutong (Pontianak)	.....	.....
Rubber scrap, imported	1,735,052	$163,726
Rubber scrap, exported	480,347	45,625

EXPORTS OF INDIA-RUBBER FROM PARA FOR OCTOBER, 1912 (IN KILOGRAMS).

	NEW YORK.					EUROPE.					GRAND
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	TOTAL.
Zarges, Berringer & Co.	125,844	47,596	162,648	23,009	359,097	307,285	26,882	21,425	18,403	373,995	733,092
Ad. H. Alden, Ltd.	99,227	15,119	53,771	19,475	187,592	41,310	1,360	31,680	.....	74,350	261,942
General Rubber Co. of Brazil	138,723	17,748	104,691	11,750	272,912	21,590	5,459	2,030	750	29,829	302,741
Suarez Hermanos & Co., Ltd.	.....	.....	.....	.....	.....	50,828	3,157	2,622	11,195	67,802	67,802
R. O. Ahlers & Co.	56,017	3,506	29,447	44,442	133,412	128,722	9,258	9,958	14,371	162,309	295,721
De Lagotellerie & Co.	31,280	2,720	11,880	.....	45,880	.....	.....	.....	.....	.....	45,880
Pires Teixeira & Co.	8,840	680	9,240	.....	18,760	4,590	340	1,320	.....	6,250	25,010
J. Marques	66,476	7,833	61,712	7,312	143,333	44,370	4,590	20,130	19,040	88,130	231,463
Syndicate J. Marques	.....	.....	22,000	103,525	125,525	.....	.....	.....	.....	.....	125,525
Sundry exporters	25,850	1,360	13,860	1,680	42,750	1,503	545	3,307	1,400	6,755	49,505
Itacoatiara, direct	.....	.....	.....	.....	.....	19,950	3,150	9,960	450	33,510	33,510
	552,257	96,562	469,249	211,193	1,329,261	620,148	54,741	102,432	65,609	842,930	2,172,191
Manáos, direct	665,746	139,448	155,338	110,748	1,071,280	401,102	56,845	46,815	45,365	550,127	1,621,407
Iquitos, direct	2,205	.....	1,305	3,139	6,649	146,329	7,547	39,018	104,327	297,221	303,870
Total, October, 1912	1,220,208	236,010	625,892	325,080	2,407,190	1,167,579	119,133	188,265	215,301	1,690,278	4,097,468
Total, September, 1912	542,227	116,810	453,169	129,404	1,241,610	824,872	128,383	142,576	173,644	1,269,475	2,511,085
Total, August, 1912	706,115	141,209	533,033	170,294	1,550,651	771,671	81,869	186,983	167,370	1,207,893	2,758,544
Total, July, 1912	579,011	117,387	324,108	160,593	1,181,099	589,286	58,728	185,106	479,399	1,312,519	2,493,618
Total, January-June, 1912	4,409,232	1,064,132	3,562,570	2,071,223	11,107,157	6,251,126	744,600	1,479,253	3,316,123	11,791,102	22,898,259

EXPORTS OF INDIA-RUBBER FROM MANAOS FOR OCTOBER, 1912 (IN KILOGRAMS).

	NEW YORK.					EUROPE.					GRAND
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	TOTAL.
Zarges, Ohliger & Ca.	196,156	33,760	64,606	5,561	300,083	205,120	30,080	7,715	18,130	261,045	561,128
Adelbert H. Alden, Ltd.	151,203	28,980	28,410	18,407	227,000	.....	1,190	3,420	.....	4,610	231,610
General Rubber Co. of Brazil	116,834	23,267	28,652	18,904	187,657	25,995	2,805	1,346	4,338	34,484	222,141
Ahlers & Ca.	71,034	15,592	2,352	6,063	95,041	83,578	9,417	31,248	20,041	144,284	239,325
De Lagotellerie & Co.	.....	.....	.....	.....	.....	102,236	12,087	12,495	950	127,768	127,768
Mesquita & Co.	.....	.....	.....	.....	.....	156	.....	486	28	670	670
Sociedade Anonyma (Armazens Andresen)	.....	.....	.....	.....	.....	2,760	740	1,337	.....	4,837	4,837
Théodore Lévy, Camille & Co.	.....	.....	.....	.....	.....	.....	.....	.....	657	657	657
W. Peters & Co.	.....	.....	.....	.....	.....	1,600	.....	2,480	450	4,530	4,530
	535,227	101,599	124,020	48,935	809,781	421,804	56,319	60,527	44,594	582,885	1,392,666
Iquitos, direct	.....	.....	.....	.....	.....	18,016	286	7,415	3,564	29,281	29,281
Total, October, 1912	535,227	101,599	124,020	48,935	809,781	439,820	56,605	67,942	48,158	612,166	1,421,947
Total, September, 1912	479,558	101,508	98,538	82,074	761,678	650,509	89,416	99,081	174,999	1,014,005	1,775,683
Total, August, 1912	194,739	34,654	44,691	38,668	312,752	388,198	32,359	60,654	90,698	572,409	885,161
Total, July, 1912	177,787	47,976	46,874	36,951	309,588	131,295	13,120	59,558	216,591	420,564	730,152
Total, January-June, 1912	2,523,525	633,319	1,019,142	860,626	5,036,612	2,791,987	465,094	665,339	2,108,191	6,030,611	11,067,223

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Rubber Scrap Prices.

LATE NEW YORK QUOTATIONS.—Prices paid by consumers for carload lots, per pound—are practically unchanged.

	December 30.
Old rubber boots and shoes—domestic	9¼@ 9⅛
Old rubber boots and shoes—foreign	9⅛@ 9½
Pneumatic bicycle tires	4¾@ 5
Automobile tires	9¼@ 9⅛
Solid rubber wagon and carriage tires	9¼@ 9½
White trimmed rubber	11 @11½
Heavy black rubber	4¾@ 5
Air brake hose	6 @ 6½
Garden hose	1⅝@ 1½
Fire and large hose	2 @ 2⅛
Matting	⅝@ ¾

Antwerp.

RUBBER ARRIVALS FOR NOVEMBER.

Details.	1912.	1911.	1910.	1909.	1908.
Stocks, Oct. 31....*kilos*	568,819	578,208	598,774	464,831	662,104
Arrivals in November:					
Congo sorts	403,281	148,361	344,885	417,392	224,772
Other sorts	4,357	63,487	54,404	68,923	65,756
Plantation sorts	161,154	70,761	53,536	47,308	6,715
Aggregating	1,137,611	860,817	1,051,599	998,454	959,347
Sales in November	430,066	226,555	483,451	262,838	355,177
Stocks, November 30	707,545	634,262	568,148	735,616	604,170
Arrivals since Jan. 1:					
Congo sorts	3,061,697	2,854,412	2,870,684	3,276,349	3,807,830
Other sorts	131,291	433,347	369,227	807,364	600,393
Plantation sorts	1,258,777	596,740	518,062	286,248	106,939
Aggregating	4,451,765	3,884,499	3,757,973	4,369,961	4,515,162
Sales since January 1	4,408,758	3,838,549	3,731,335	4,230,080	4,917,886

RUBBER ARRIVALS FROM THE CONGO.

NOVEMBER 26.—By the steamer *Elisabethville:*

Bunge & Co	(Société Générale Africaine)	*kilos*	55,500
do	(Chemins de fer Grande Laos)		6,000
do	(Belgika)		1,200
do	(Comptoir Commercial Congolais)		15,400
do	(Alberta)		600
do	(Comfina)		27,500
Société Coloniale Anversiose	(Haut Congo)		18,450
do	(Lomami)		14,100
do	(Cie du Kassai)		83,500
do	(Cie franc. du Haut Congo)		8,700
Willaert Freres			4,000
Société Générale de Commerce	(Alimaienne)		2,300
Charles Dethier	(American Congo Co.)		490
Divers			3,100 240,840

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

[From January 1 to November 18, 1911 and 1912. Compiled by the Ceylon Chamber of Commerce.]

		1911.	1912.
To Great Britain	*pounds*	2,811,151	6,477,696
To United States		1,568,339	3,572,959
To Belgium		641,783	999,707
To Australia		38,865	226,055
To Germany		44,338	156,364
To Austria		3,088	63,788
To Japan		49,308	55,118
To Canada		13,830	22,078
To Italy		8,460	5,909
To Russia		.....	2,288
To Holland		12,893	2,282
To France		117	2,017
To India		196	400
To Norway and Sweden		.....	39
To Straits Settlements		3,216	.....
To Africa		35	.....
Total		5,195,619	11,586,700

TOTAL EXPORTS FROM MALAYA.

(From January 1 to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To		Singapore, Nov. 5.	Penang, Sept. 30.	Port Swettenham, Oct. 15.	Total.
Great Britain	*pounds*	8,747,192	6,524,141	13,339,551	28,610,884
Continent		312,264	15,063	1,781,693	2,109,020
Japan		424,803	.....	.....	424,803
Australia		80,387	.....	.....	80,387
Ceylon		2,217	197,760	687,839	887,816
United States		2,194,684	933	2,081	2,197,698
Total		11,761,547	6,737,897	15,811,164	34,310,608
Total, 1911		5,400,798	3,565,100	9,141,828	18,107,726
Total, 1910		3,226,681	1,652,782	6,500,709	11,380,172
Total, 1909		2,181,097	1,739,291	.....	3,920,388

Amsterdam.

JOOSTEN & JANSSEN report [December 11]:

Today about 56 tons were offered for sale (principally *Hevea* and *Ficus*), of which 40 tons were sold at an advance over valuations of about 4 per cent.

Rotterdam.

HAVELAAR & DE VRIES report [December 11]:

In yesterday's sale there were offered about 60 tons Congo and about 6 tons *Hevea* which realized an advance of about 5 per cent. on valuations.